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NAVE OF THE CARMELITE CHURCH, VENICE

THE AMERICAN ARCHITECT

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Trimstone and Building Ornaments

An Address by Adolf Schilling Before the National Conference on Concrete Housing

FIFTEEN years ago, when I started to make concrete attractive and pleasing to the eye, I accepted as definitely settled concrete's claim for strength and endurance, demonstrated by the engineers in their work of that time and by the examples of ancient concrete work still in existence, some of it dating back 2000 years.

My researches and experiments have been devoted entirely to giving concrete the attractive and artistic qualities which would make it interesting to the architect and decorator as a medium for embellishment and actual construction in their work. If, for this reason, my remarks are of less technical interest to engineers and contractors for monolithic concrete construction, I ask their indulgence, to consider concrete for a few minutes more from the esthetic than solely from the standpoint of utility.

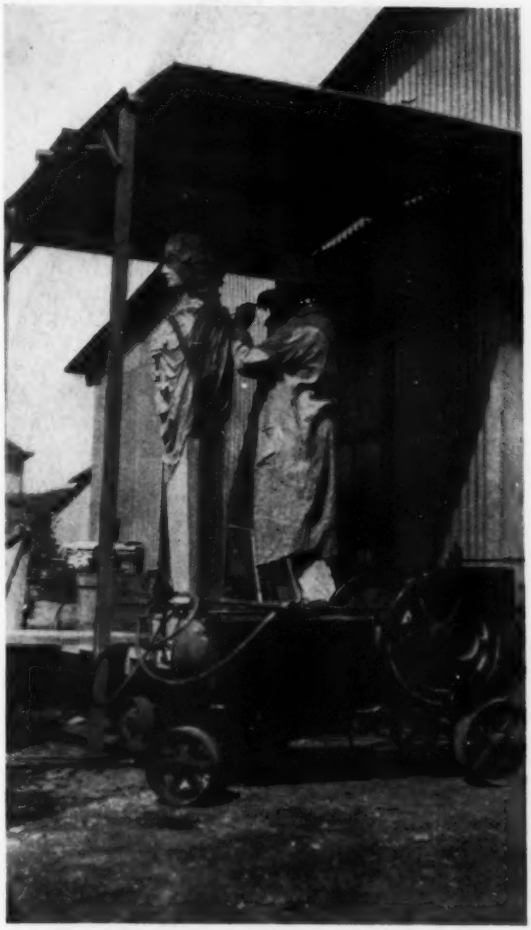
Twenty years of practical experience among the natural stones used in monumental and building work enabled me to realize the conditions that must be met, to give concrete a place alongside of the limestones, marbles, granites and clay products in which the architects had expressed their thoughts almost exclusively.

In the making of concrete, after once thoroughly understanding the qualities of cement as a binder or matrix, one can learn to adopt many mineral and metal resources as readily as we employ the better known sand, gravel and crushed stone for aggregates.

BUILDING TRIM

After proving to my own satisfaction that cast stone could be made successfully, it required considerable missionary work to convince the architect of its merits and advantages for use in building construction and enrichment of design, so far claimed by terra cotta, natural stones, faience, etc. The many examples of cast stone executed during recent years give ample proof that the confidence of the early pioneers in the possibilities of high-grade concrete products was well founded.

Cut cast stone has been specified by progressive architects for high-grade buildings in many localities. The field has been opened and it now rests with the individual and joint effort of everybody producing concrete units for building purposes to convince the architect, engineer and contractor that standard concrete products are what they want and



CAST STONE TERMINAL BEING RETOUCHED WITH PNEUMATIC TOOL

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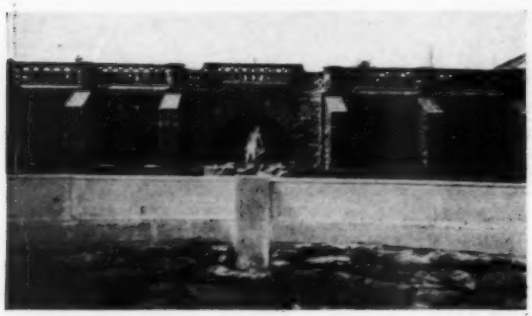
PERGOLA—CAST STONE WITH ROUGH AXED AND BARK COVERED WOOD AND LOCAL QUARRY STONE WALLS. ROSEMONT, PENNA.

can get, no matter if it is for the foundation or for the richly ornamented entrance of the work in hand. It must be our purpose to establish co-operation that offers dependable concrete products *to meet the requirements* of the building trade in quality and quantity.

To cover the methods of manufacture in detail would exceed the limit of this report. We have successfully used plaster, glue, wood, sand, cement and steel molds. More general information regarding the use of same will be made available by me to anybody interested.

A kind of mold extensively used in our plant is made of channel irons, in sizes from 2 in. to 18 in. wide, and in lengths from 4 ft. to 8 ft. If set on level tables or benches, the main part of a mold is provided that offers great flexibility in its use; the channel irons are held together by different length rods at the ends; wood or plaster inserts, plain or molded, determine the width, length and design of the unit to be cast. The work is poured with finished face down and can be solid or hollow, surfaced with special material on any one side or all four sides, if the volume of the stone makes it more economical to use a core of less valuable aggregates.

Some excellent work has been done modeling directly with cement mortar by artists who have attained their efficiency in this method abroad; the most important work of this kind, to my knowledge, is a group of the Crucifixion of heroic size, at Lynn, Mass.



COPING OF CIRCULAR WATER BASIN AND BALUSTRADE OF CAST STONE; WALLS OF LOCAL QUARRY STONE. ROSEMONT, PENNA.

ENTRANCE OF Y. W. C. A. BUILDING, CHESTER, PENNA.

The artist builds up his design with permanent skeleton frame work, similar to modeling in clay. Around this skeleton he forms a rough outline of the design in wire cloth or expanded metal, and on this is placed a scratch coat of cement mortar on which when set he begins to model the final outline of his design. The artist is enabled, by using mixtures of quick and slow setting cement mortars to

regulate his medium. In this way he can give the work the same freedom and spirit as if he modeled in clay, producing any texture desired; color effects can be obtained at random by using colored cement of various shades; for instance, a garland of flowers can be modeled in their natural colors. There

DETAIL OF EXEDRA SEAT OF CAST STONE, ROSEMONT, PENNA.

is no difficulty in producing in cement the well-known Della Robbia effects, the same as is done in faience and colored marble. This method is particularly of interest and value where only one piece of a large ornamental design is to be used, thus avoiding the expense of molds and setting the cast in place. It also prevents unauthorized replicas of original designs, so annoying to the artist when he finds his conception misused.

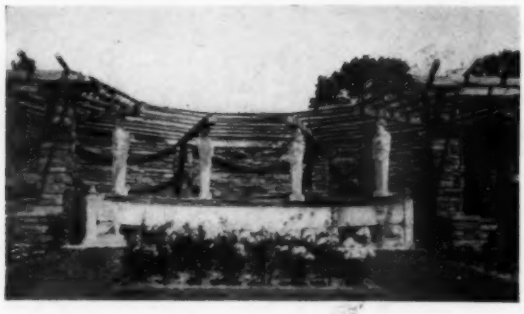
CORNER IN A GARDEN. CAST STONE ORNAMENTS AND LOCAL QUARRY STONE WALLS. ROSEMONT, PENNA.

For treating of surfaces we use electric rubbing wheels to produce a smooth finish, acid for grain texture finish, and any of the tools used in the natural stone trade for cut finishes, according to the effect desired in the cast stone; any one or all treatments may be used on one piece. We have transportable rubbing and tooling machines to surface the extra heavy casting, and stationary machines for the smaller units. A cutting plant for natural stone is an ideal foundation to start an up-to-date cut cast stone business, even to the use of its rubbing beds and gang saws.

Concrete of proper age can be treated just like any natural stone, using the same tools and machinery to dress its surfaces, or to saw cast blocks of large size into slabs and strips. It is my strong conviction that the success of concrete stone for building purposes rests in a close affiliation of the stone caster and the stone cutter. Only in this way will we be able to give concrete proper texture and the necessary qualities of dimension stone, so essential to the architect and builder for durable and attractive construction.

The addition to every concrete products plant of

CAST STONE SCREEN AND ORNAMENTS WITH LOCAL QUARRY STONE WALLS. TEXTURE AND COLOR OF SCREEN MADE TO HARMONIZE WITH QUARRY STONE



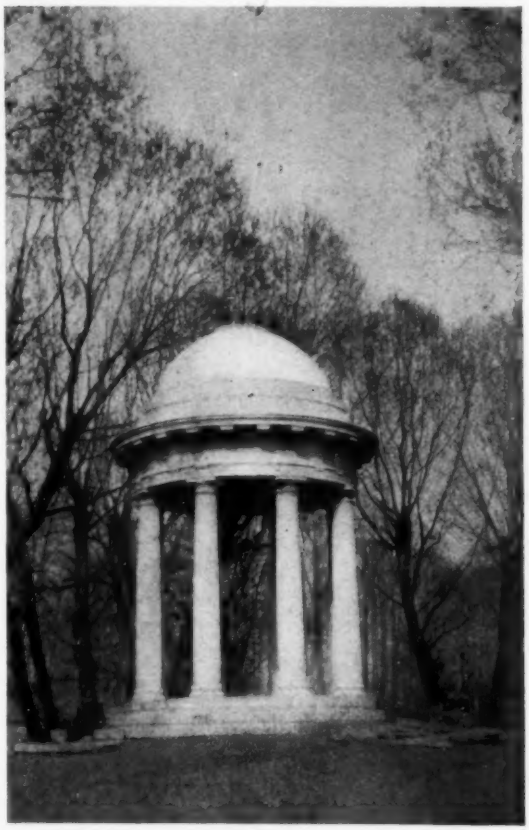
EXEDRA SEAT, 25-FOOT RADIUS "FOUR SEASONS" SUPPORTS IN CAST STONE. ROSEMONT, PENNA.

skilled stone cutters would be a source of profit and also result in better work. The stone cutter is trained to have dimension stone true to size and shape. The average worker in cement or concrete does not appreciate this essential point, but it is all-important with the architect and general contractor. The services of a stone setter will enable the concrete products plant to set its own work, which is very desirable for the best results. We found the brick or natural stone mason did not give composition stone the required care when setting same, for reasons of trade jealousy, but once this fraternity understood that concrete stone gave extensive employment to stone cutters and setters, their antagonism vanished as they realized their own benefit in the broader use of cast stone. Whenever the opportunity presents itself, I strongly recommend closer affiliation of the composite and natural stone trades. The enormous increase in all building operations of whatever class and the constant effort for betterment in the moderate-priced home, give abundant field for both trades in a more permanent class of work and at more satisfactory profits.

ROSE TRELLIS SUPPORTS—CAST STONE TREATED WITH SULPHATE OF COPPER TO PRODUCE COLOR EFFECT. STATUE BRONZE, TRELLIS WOOD STAINED BROWN, STEPS LOCAL QUARRY STONE. ROSEMONT, PENNA.

It has taken many years to bring the craft of dressing natural stone to its present efficiency. The progressive concrete products man should study these methods and benefit by the experience of the trade whose product he must equal or better to meet approval by the architect.

To the manufacturer or worker of concrete products I further recommend the adoption of such



TEMPLE OF LOVE, CAST STONE. DOME IS MADE MONOLITHIC BY SETTING EIGHT RIBS AND PANELS AGAINST CROWN AND FORMING REINFORCED CONCRETE COVERING. ROSEMONT, PENNA.

methods as are employed successfully in other lines of manufacture in treating the surfaces of their product. In many cases instead of applying paint with brush, the article is immersed in the paint. This method can be adapted to acid washing of the concrete products, to remove the surface film and expose the aggregates. Tanks of sufficient size are not a hard matter to construct in the concrete shop, and the immersion of concrete products in acid solution will not only prove a great saving of acid

and labor, but produce a class of work that cannot be obtained with the scrubbing brush. We use two rectangular tanks 4 by 4 by 16 built of cement slabs, grooved and bolted together, and six circular wood tanks 7 ft. diameter and from 2 to 4 ft. deep. Concrete should be from two to three weeks old before treating in acid bath; duration of bath depends on age of the stone, and if rough or fine texture is desired, the time being from one to ten hours. A solution from 1 to 20 up to 1 to 10 is recommended, and after the article is put in the tank the solution does the rest. This style treatment preserves the edges and details of the design and makes the surface uniform. Any of the hard spots not sufficiently affected by the acid bath can be treated separately after the article has been flushed with clean water. Care must be taken that the aggregates of the surface are nearly uniform in hardness, or the acid will destroy the soft portion before the harder particles have been cleaned of the cement coating. I have had some very fine work spoiled where, to obtain a certain effect, I mixed black marble (a limestone) and crushed granite. The acid bath left only the holes where the black marble had been, while the granite showed a very fine texture and natural color. Judicious handling of this effect can produce desired results in texture, like Travertine stone, etc.

To produce color effects we may use gray or white Portland cements, separate or mixed in certain proportions, adding to this suitable pigments, but in such cases the natural colored aggregates, sand, silica, pebble grits, marble and granite, will give excellent and more uniform results. It requires great skill and care to properly mix cement and color pigments without reducing the strength of the cement and still obtain good color effects.

The importance of mixing the pigment thoroughly with the cement, before adding the aggregates, should be understood before attempting to make concrete in colors successfully on a large scale.

As a very simple method to test the proper amalgamation of the pigment with the cement, take a handful of the dry mixture and press it under a sheet of stiff paper; this will produce an even surface of the material, and when this surface does not show absolute uniformity in color the mixing is incomplete. If small specks of color show under this test, these same specks of unassimilated pigment will appear in the finished concrete. So far a very important factor that can be utilized for coloring concrete or cement has been given little or no attention; while very simple in its primary action, the successful application requires thorough understanding of the principle and medium employed.

This refers to the absorptive qualities of concrete during its stage of curing and seasoning, which offer opportunities for coloring concrete products by capillary action. By this method the color is deposited into the pores of the surface, amalgamating with the concrete into a permanent unit. The possibilities of this treatment are unlimited if based on knowledge of coloring values and good judgment not to impair the strength requirements of concrete. Coloring solution can be made to penetrate the surface of concrete 6 in. or more, if the object is immersed while in a very green state, but it is rarely necessary to penetrate more than 1/32 to ⅛ of an inch; this thoroughly fills all pores, gives the desired color effects and is less expensive. Every atom of coloring absorbed by the concrete reduces the strength of the solution; and as some of the coloring matter used is quite expensive, good judgment to allow only the necessary absorption of coloring matter is advisable from an economic standpoint. The sulphates of copper and iron are the most suitable to make solutions to color concrete by the capillary method.

Concrete can be so treated after it is a week old. When used in construction and carrying loads it should not be subjected to the coloring bath until the concrete has attained its required strength, as the filling of the pores in the concrete retards the action of hardening. Coloring by absorption is effective on concrete after it comes out of the mold or after being treated with tools. Surfaces that have been colored by absorbing mineral or metallic colors become more weatherproof and the action of the weather on the metallic colors increasing the beauty of coloring by the usual oxidation noticed on bronze and copper. Concrete treated by this method becomes so hard and dense that it will take a polish. I have treated its surfaces in the same manner as marble, granite and metal under polishing or buffing machines.

Wet cast concrete products, such as flower pots, vases and boxes, will hold water after the second day of casting and become so hard that when struck with a hammer they ring like a metal bell; waterproofing compound helps, but is not essential to obtain this result. I consider that the thorough mixing of the proper amount of cement and water with graded aggregates is all-important. Extensive tests made during the past three years with commercial waterproof paints produced excellent results. Common concrete can be made very attractive by one or two coats, and applied in stipple fashion, it will not impair the grain or texture, avoiding the undesirable appearance of brush-painted stone. This method is especially to be recommended for dry or semi-dry tamped concrete work, the porous surface readily absorbs the waterproof liquid and thereby

allows the pigment particles to fill the pores.

By using spraying machine the color effect is obtained most economically. It gives a uniform color or can be varied to give the richness and depth of shading that results from this treatment in experienced hands. It can be applied where immersion is not practicable. I have obtained two and three color effects by painting certain parts of an object before subjecting same to the coloring bath. The parts so colored would not be affected by the color in the bath, the absorptive quality having been neutralized.

The artistic possibilities of such treatment are only limited by the color sense and taste of the craftsman. Using certain non-absorptive aggregates their natural color can be retained, while the absorptive parts, especially the cement mortar will assume the desired color. Precaution must be taken in the use of acid washing before immersion in the color bath as the chemical action of the acids is liable to counteract the color values of the bath. Acid should not be employed after concrete is treated with colors.

Long practice and tests will give the full benefit of this process.

In the matter of surface finishes, considerable headway has been made and most of the methods are well known to the progressive concrete man. Many are so simple and inexpensive that concrete need not remain unattractive to the architect.

Most of our trim stone and ornamental work is wet cast, it is required to stay in the mold from 24 to 48 hours, and we use a 4 per cent solution of calcium chloride for our mixing water; during cold weather our shops are steam heated and kept at a temperature of 70 degrees.

We do not use curing rooms, but for quick hardening use high pressure steam cylinders 6 feet in diameter and 70 feet long. We have commercially verified the tests made some years ago by the U. S. Bureau of Standards and reported in Technologic Paper No. 5.

While these tests did not exceed 80 pounds pressure, we have hardened concrete with 150 pounds steam pressure, obtaining results so that concrete 2 days old could be tooled under rapidly revolving carborundum wheels, cutting flint aggregates without pulling out or fraying the edges. The mixtures used were from 1 to 10 to 1 to 5. Compression tests showed over 4,000 pounds in two days and absorption less than 5 per cent. The higher the steam pressure the less time it requires to harden. With 150 pounds we reduced the time to 4 hours, besides the two to three hours it requires to bring the pressure up to 150 pounds. Concrete so hardened has been subjected to weathering for several years, proving equal to naturally hardened concrete.

No Portland cement concrete product should be subjected to high pressure steam curing until it has its initial set. The steam hardening should start preferably the day following the casting.

Tamped concrete should be kept moist until it goes into the cylinder. As the expense of equipment and operating is considerably higher than curing rooms, only units that lend themselves to completely filling the cylinder space, can be hardened economically, like brick, tile or blocks; at present prices it costs about $20.00 to harden a volume equal to 900 cubic feet or 20,000 brick. The cost of a cylinder of above size is $6,000 installed. They should be used in pairs to allow the utilizing of steam blow off, from one cylinder to the other, after the curing is finished.

In conclusion I maintain that with honest concrete we can interest the architect, engineer and builder in its general use and while not assuming to instruct them in their choice of material, we can advocate the most extensive adoption of our products if made on the principles of concrete for quality and permanence.

Crushed marble and granite with Portland cement as a binder produces a reconstructed stone of natural components which can be dressed and finished like natural stone without being an *imitation* stone or a misuse of *concrete*. It gives us a staple building material, combining the beauty in color and texture of the natural stones with the strength and economy of concrete.

Protective and Operative Features of the Emergency Contract

By MAJOR RALPH H. CASE, CHIEF OF CONTRACTS DIVISION, CONSTRUCTION DIVISION OF THE ARMY

SHOULD any citizen now visit official Washington, and, meeting a stranger, desire to know his political affiliations, a simple method is to flash in his face a cost plus contract. In nine cases out of ten the result will be that the stranger either will fall into a semi-comatose and wholly inarticulate condition or will leap upon you and rend the cost plus contract into shreds, gnash his teeth and wail about the "wanton, wanton waste of public money." The first is the condition of an administration supporter. The second an administration opponent. On the cost plus contract the great general division is between those who have nothing to say about it and those who have everything to say about it, *and say it!*

Mark Hanna, at the cost of boundless ridicule, epitomized the trusts by saying: "There are good trusts and bad trusts." Time and the United States Supreme Court in the Steel Case has proved Hanna was right and his epigram can be applied by saying: "There are good and bad cost plus contracts." The bad ones are being abundantly taken care of by their critics but the good ones have been neglected. The best of all the war contracts is the Emergency Contract, cost plus fixed fee used by the Construction Division of the Army on a billion dollars worth of construction work during the war.

This contract was drawn to permit operation free from the old red tape methods of Government practice and at the same time to protect the interests of the Government. The protective features of the Emergency Contract stand out in 14 points. Why 14 and only 14 is not so impressive as the fact that the protective points stand at the magic number. Each and all of these points are in sharp contrast to the provisions of the old lump sum Government contract, let on bids after advertisement and on plans and specifications prepared in advance.

First. The contractor is required to purchase material from such firms and at such prices as the Government may direct. This protects the Government from excessive charges for material, allows material to be purchased in quantity and allocated to different projects, allows checking by the Government as to qualities and grade and permits no payments except on written acceptance by the Government. By this provision the whole question of purchase and allocation of materials was absolutely controlled.

Second. All wages paid for labor are determined by the Government and no deviations allowed without prior consent of the Government. This protects the Government from excessive wages and competitive bidding for labor. It permits the handling of the labor question as a unit, precluding speculation and competition made for uniformity of wages and made it impossible for contractor to enhance the cost of any project by increasing wages.

Third. Contractor's equipment is brought on to the job only with the consent of the Government and is under control of the Government and may be laid off at any time. Rates of rentals are stipulated in the contract and this rental applies on the purchase of the equipment if the Government elects to take it over. This protects the Government absolutely from over charges for rental equipments and makes it impossible that more than the appraised value of the equipment be paid as rental.

Fourth. The contractor is required to carry his own main office overhead and the contractor is paid no fee on losses and expenses, the cost of reconstructing and replacing of any work destroyed or damaged. The United States is thus protected from charges for salaries not coming directly under its control and pays no fee on work restored or replaced. This protective item disposes of any possibility of the contractor permitting the destruction of any portion of the work and then being paid a fee for its reconstruction.

Fifth. The general contractor's fee is limited on all work done under subcontracts to 2½%, regardless of the extent of the subcontractor's work. This protects the United States from paying double fees for construction work and deters the general conractor from subletting his contract.

Sixth. The contractor is required to turn into the Government rebates, refunds and net revenues from operations of commissaries and these sums are applied in reduction of the cost of the work. This protective item is twofold. It reduces the cost of the work on which the contractor's fee is computed and it makes certain that no commissary will be operated by a contractor for his own benefit and profit. This insures a high grade of commissary service to the laborers on the job, good

food and plenty of it, being always an inducement to men to say where they can be so served.

Seventh. The United States has the right at all times of free access to the records of the contractor. The United States is thus protected from padded or built records and from fictitious charges.

Eighth. All subcontracts are required to be approved by the contracting officer and all are bound by the terms of the principal contract. This gives protection against inefficient subcontractors and against improper subcontracts or those not conforming to the spirit and intent of the general contract.

Ninth. The United States had the right to terminate the general contract and all subcontracts. This right protected the United States from almost endless suits. By its exercise, construction work was stopped on the signing of the Armistice. Settlement was made for the work done, pay being figured on the amount of work accomplished. Under a lump sum contract there is no such provision and the contract can only be terminated on default of the contractor. Had this provision not been included, contractors would have been in position to bring suit for their anticipated profits. The losses caused by stopping the work would have been staggering in amount.

Tenth. The Secretary of War is made final on all matters of dispute between the contractor and the contracting officer. This protective item compelled the contractor to submit to the decision of the Secretary of War all questions, but at the same time afforded him an appeal from the decision of the contracting officer. Without this protective item a great amount of litigation would have ensued.

Eleventh. Throughout the contract the contracting officer has the right of approval or disapproval of expense for bonds and insurance, for freight and equipment being hauled more than 500 miles and all permit fees, royalties and all other similar items of expense. The United States was thus protected against increased cost and sundry items of expense by the approval or disapproval of each separate item as it arose.

Twelfth. The contractor is not allowed any interest on his working capital. This was a very important protective item as every contractor was required to carry disbursements running up into large amounts and it was necessary that he have a substantial working capital in order to prosecute the work. This item, however, made it impossible for the contractor to ever claim interest on the capital he employed. The saving in this item alone runs into the hundreds of thousands of dollars.

Thirteenth. The maximum amount payable to the contractor as fee is fixed by the terms of the contract and it is provided that in no event shall he be paid more than a certain stipulated sum. This item actually took the entire contract out of the so called cost plus percentage class and made it a cost plus fixed fee contract. Regardless of the amount of work the contractor was ordered to do, his fee was not enhanced unless in certain instances the amount of work performed was grossly out of proportion to the fixed fee in which event, a Supplemental Agreement could be made allowing a minimum fee on the additional work.

Fourteenth. The most important protective feature of the entire contract lay in the fixing of the amount of the maximum fee to be paid the contractor. The real advantage of the fixed fee lies in the manner in which the fee is arrived at. These fees were necessarily based upon estimates of the amounts of work to be performed. In all cases the fixed fee was based upon the minimum estimate and not upon either an intermediate or maximum estimate of the amount of work. The fixing of the fees in this manner absolutely protected the United States from padding of the cost of the work and took from the contractor all inducement to enhance the cost of the work. From the time the contractor went onto the work he knew that he would reach the maximum fee fixed in the contract and therefore, it was not to his advantage to permit or allow the cost of the work to be increased. This item effectually prevented voluntary or permissive enhancement of the cost of the work by the contractor or a subcontractor. It alone saved millions of dollars to the Government. How many millions cannot be stated as there is no telling to what length costs would have run without this fourteenth protective item.

These are the great protective features of the Emergency Contract, yet they alone do not show the difference in operation between this Emergency Contract and the old lump sum contract. Protection of the Government's interests is highly important, yet it alone is not sufficient. Far greater in importance is the positive feature of operation. A course of action may be eminently safe but wholely worthless in operation in that it fails to accomplish the desired result. "By their works ye shall know them," and the final judgment on the Emergency Contract must be made on the record of accomplishment made by the Construction Division of the Army through the use of the Emergency Contract.

When the Emergency Contract first went into use the war was on, the National Guard had been called to the colors and the machinery for selective service was under way.

(To Be Concluded)

Simplification

IN architecture, as in any of the fine arts, simplicity is the fundamental excellence. It is interesting in considering any of the things that affect one of the arts to trace how equally they affect all of the others. The writer who sits down in quietness and seclusion to place his thoughts on paper is but securing the same freedom from interruption to the play of his mind as the painter or architectural designer will find equally necessary. And when the writer, the painter, the sculptor or designer reviews his work, he will at once learn that in the exuberance of his mental attitude he has overclothed his subject. If he has the genius necessary to the creation of a worth-while thing, he will at once set about divesting what he has done of verbiage, of overfloridness, and will strive to express the idea to be conveyed in the simplest form he can devise.

The greatest works in any of the arts are those that can be appreciated by the largest numbers. To create a common language in art it therefore becomes necessary to express the thought in the simplest form. The idea is well expressed by a quotation from *Punch*. Giles, the gardener, on being asked by his lordship how he liked the new minister, replied "he might be all right but not so very clever" as he could understand every word he said. The point of this lies undoubtedly in the fact that the minister must have been undoubtedly clever to have clothed some great thought expounding a vital problem in words so simple that even Giles, the gardener, could comprehend.

Much of our art, and particularly of our architecture, is vulgar by reason of a pedantic use of motives that spectacularly and in an ill-bred way present a problem. Things created on such a basis are past reform. No amount of additional and even well-chosen ornament can redeem them. False in its basic elements it is false all the way through. But given the simple, correctly done thing, and its very excellence of proportion accents its merit. No added ornament can improve it.

Most of the fault lies in a tendency to stress the minor facts and to overlook the correct interrelation of large masses. In the painter's art there are many men who can paint a most creditable small picture, but are utterly incapable of producing a large one. The reason for this is that they have not their facts of nature sufficiently well learned to execute them on a large scale. Certain designers in architecture have the same limitations. They can successfully handle applied ornament but not all the elements of the entire design. So then, it becomes a matter of knowledge, of simplification based on the actual ability as the result of education. It would therefore appear that simplification in the highest form is the surest indication of knowledge and that only the vulgar and uneducated will be misled by floridity or a rococolike presentation.

The Dilution of Labor

That conditions of service as rendered by organized labor have fallen below a necessary standard would seem to be as true in England as in this country. This deterioration of efficiency *The Architects' Journal* of London describes as "the dilution of labor." In every country engaged in the war, military service demanded that men in all ranks of skilled labor take immediate service. Likewise, the very necessity of skilled labor to meet the urgency of war needs was largely accentuated. It became necessary to call on every non-combatant, male and female.

Writing of these conditions *The Architects' Journal* well sums up conditions as follows:

"Fingers that had driven a pen or handled a pick now found themselves closing round a rifle. New movements, new duties had to be rapidly learned and undertaken. Courses of training in the past spread over years were now telescoped within the period of a few weeks. Intensive application of the very latest ideas and methods produced the soldier in a period unthinkable to those upon whom it fell to train the army before the war.

"What was true of this great combatant force

was also true of the still larger auxiliary army of workers which at home was required to supply the army in the field with the munitions of war. Factories devoted to the production of objects desired in peace were now diverted to the manufacture of arms and ammunition. The call for labor was as strident and insistent as the call for recruits. All who were working, all who had worked, all who were not working, all who never dreamed they would ever work, were pressed into request in the frantic effort to keep pace with the demands which modern warfare made. Factories were reconstructed, new ones were built, old plant was scrapped, new plant installed."

THE war's close brought all the complex problems of a return to peace. Men who had contentedly toiled in certain trades were on their return unwilling to go back to them. Their experience in service had given them other and oftentimes higher ideals. Thousands never returned. Meanwhile the various trades and crafts were beginning once more to assume a peace-time basis, and in many important industries in place of the skilled labor that at one time did the work, the factories were filled with those whose experience was limited to the comparatively brief period of the war's duration. What has accented this condition of the dilution of labor is the failure of the trades unions to recognize a situation that every large employer of labor keenly appreciates. There is not considered the very large difference in skill or capability between this hastily and imperfectly educated labor and that which through long years of service has gained high efficiency.

These things have affected the character of service as rendered by labor until a point has been reached where one cannot calculate the exact difference in the scale of wages as now paid and that of ante-war times. Then labor was almost standardized as to efficiency. Today the character of service is often so poor as to largely augment the cost of production and very materially increase the high cost of everything we buy. Labor has succeeded in forcing compliance with its demands to a point that the most optimistic leader never dared dream of. There should now be shown by those who lead labor a desire to maintain all the early traditions of good craftsmanship. A good way to show such a disposition would be to discipline every member of a union who might be convicted of inefficiency or the rendering of a poor quality of service. When labor adopts this attitude toward its members, those who pay the high wages demanded will receive something more nearly a just return.

On Framing Pictures

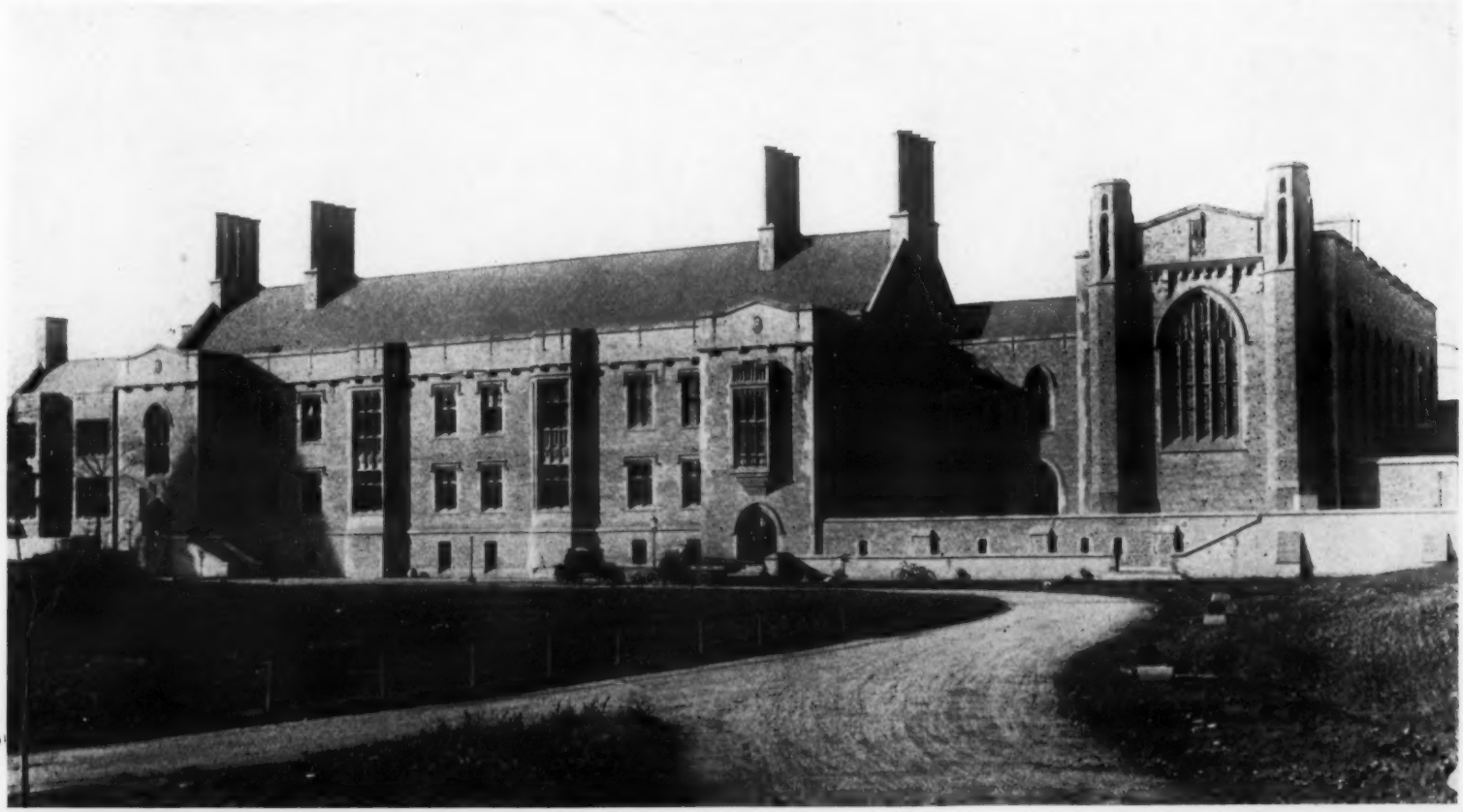
FOR years it has been an accepted rule that all pictures in oil or water-color shown at exhibitions should be framed in gold. This uniformity has served to "cut in" each picture from those surrounding, and it has been generally conceded that the neutral quality of a gold frame was exactly the proper one correctly to show the painted canvas.

The Royal Academy has recently announced that at its forthcoming Summer Exhibition, and until further notice, frames other than gold will be admissible. Those who advocate this change in framing base their contention for a wider latitude of selection—that it is not correct to infer that a gold frame is suitable for all pictures and they state that what is right for one picture may not be at all suitable for another. All of which is quite true, as it is also true that a wooden frame, painted, stained or gilded that might admirably suit a given picture would absolutely kill the color values of its neighbors.

This same objection could never be urged against the gold frame. Most of the difficulties as to appropriateness in framing in gold lie in the fact that the frames are used custom-made and seldom with reference to the character of mouldings or the color of the gold suitable to a given picture. Artists as a rule have certain adopted color schemes and methods of technique. With these canvases there is a distinct type of moulding suitable. It may be ornate and full of high lights to accent a sombre picture or it may be plain (the Whistler frame for example) and absolutely flat in its effect of contrast. The color of the gold will range from the warm bronze colors clear through to the grey tones. There will be some one of these many possible combinations that will fit any color of picture ever painted and it is certainly true that it will not fight its neighbor or be so assertive as to mar the appearance of the entire wall on which it is hung.

It is safe to predict that the Royal Academy will soon tire of an exhibition where such latitude as to the selection of the color and material of frames is allowed. Undoubtedly the result will be a series of walls of such strong assertiveness as to frames that the value of the pictures will when thus grouped become very seriously marred.

Certain latitude in these matters is allowable in architectural exhibitions where there is a wide range of pictures on a great variety of media. But to allow this same latitude as to framing at one of our Academy exhibitions would, it is quite certain, create a result that would not meet the general approval of artists.



HART HOUSE, UNIVERSITY OF TORONTO, CANADA

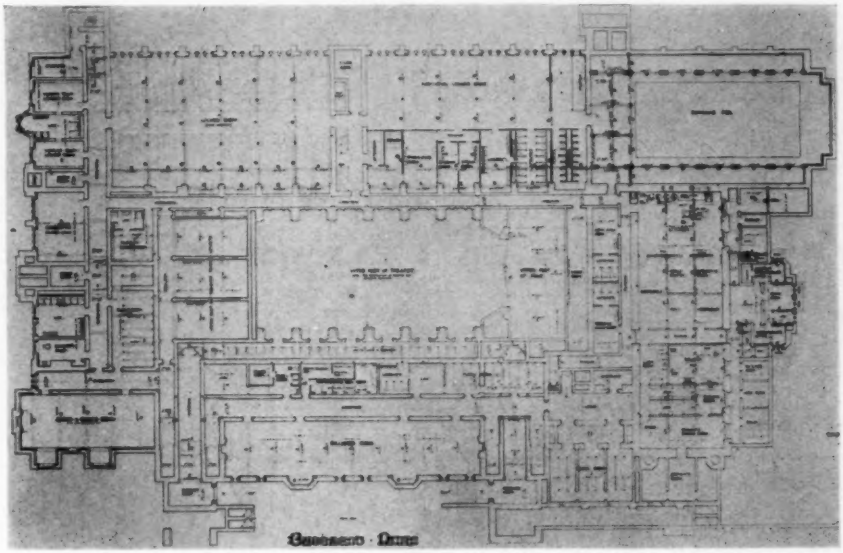
SPRATT & RALPH, *ARCHITECTS*

The building contains assembly and dining rooms, libraries, gymnasia and a theater

GREAT HALL, HART HOUSE, UNIVERSITY OF TORONTO, CANADA

SPRATT & RALPH, *ARCHITECTS*

Perpendicular Gothic with arched roof of solid oak hammer beam trussed. The mullion windows, 11 feet high, show the arms of the universities of Great Britain and her colonies. The room is lit by bronzed chandeliers

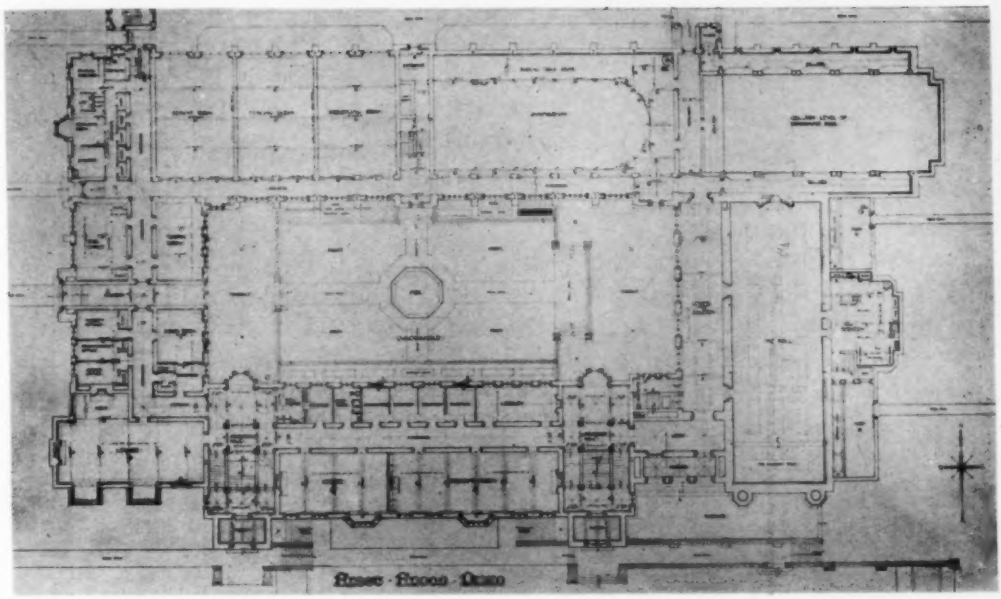


BASEMENT PLAN

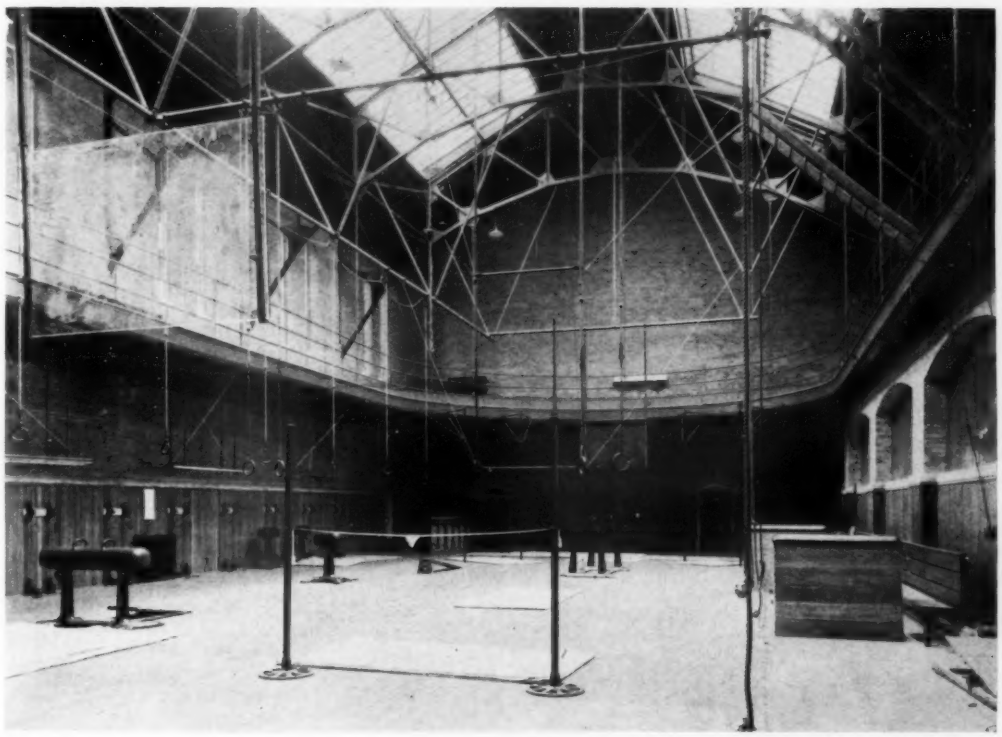
FOYER OF THE THEATER

HART HOUSE, UNIVERSITY OF TORONTO, CANADA

SPRATT & RALPH, *ARCHITECTS*



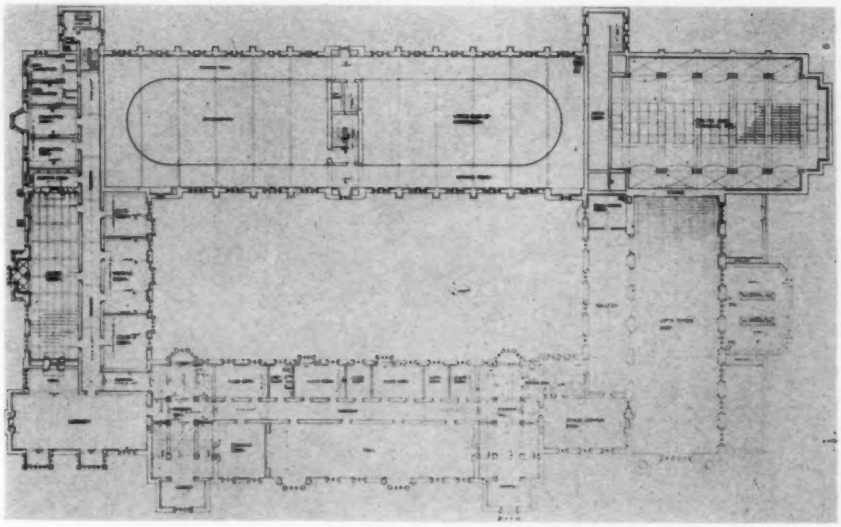
FIRST FLOOR PLAN



GYMNASIUM

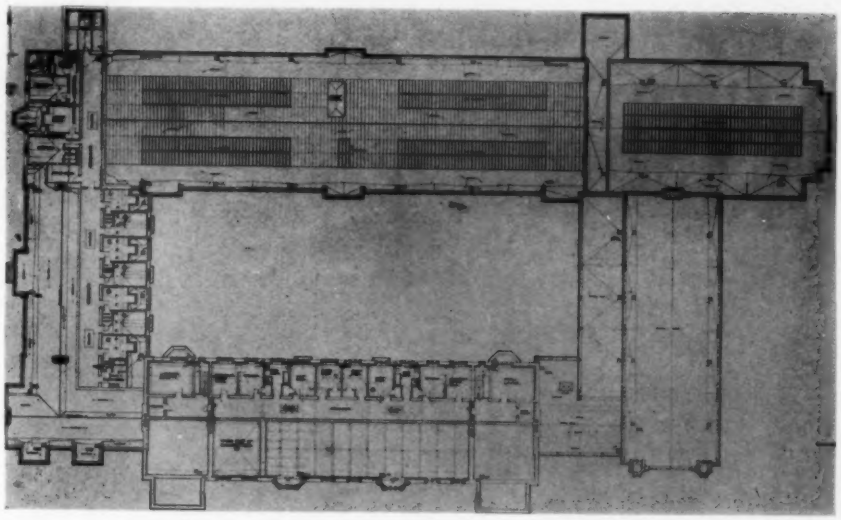
HART HOUSE, UNIVERSITY OF TORONTO, CANADA

SPRATT & RALPH, *ARCHITECTS*



SECOND FLOOR PLAN

THE GALLERY
UNIVERSITY OF TORONTO, CANADA
SPRATT & RALPH, *ARCHITECTS*



THIRD FLOOR PLAN

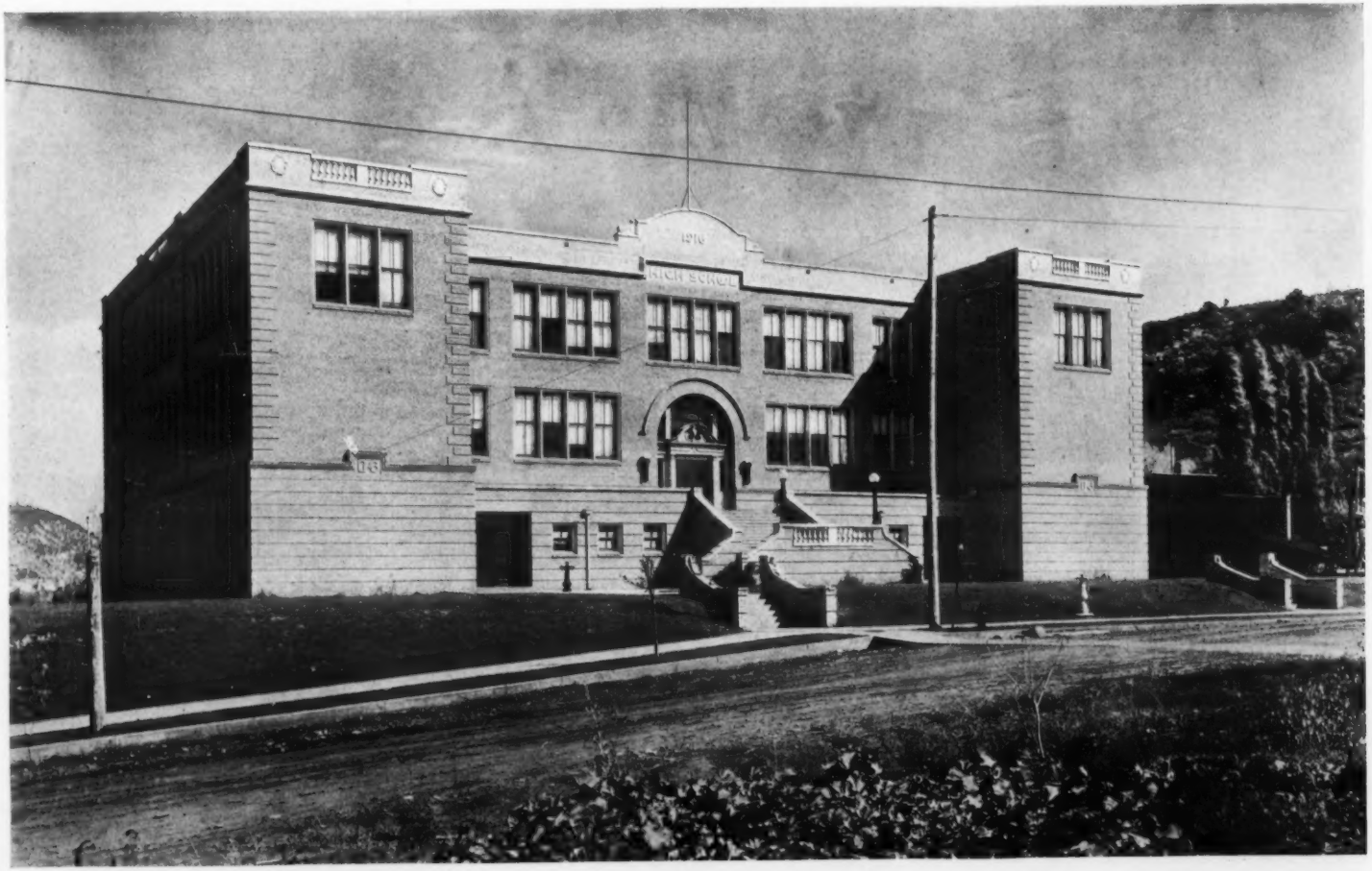
FACULTY COUNCIL ROOM
HART HOUSE, UNIVERSITY OF TORONTO, CANADA
SPRATT & RALPH, *ARCHITECTS*

QUADRANGLE

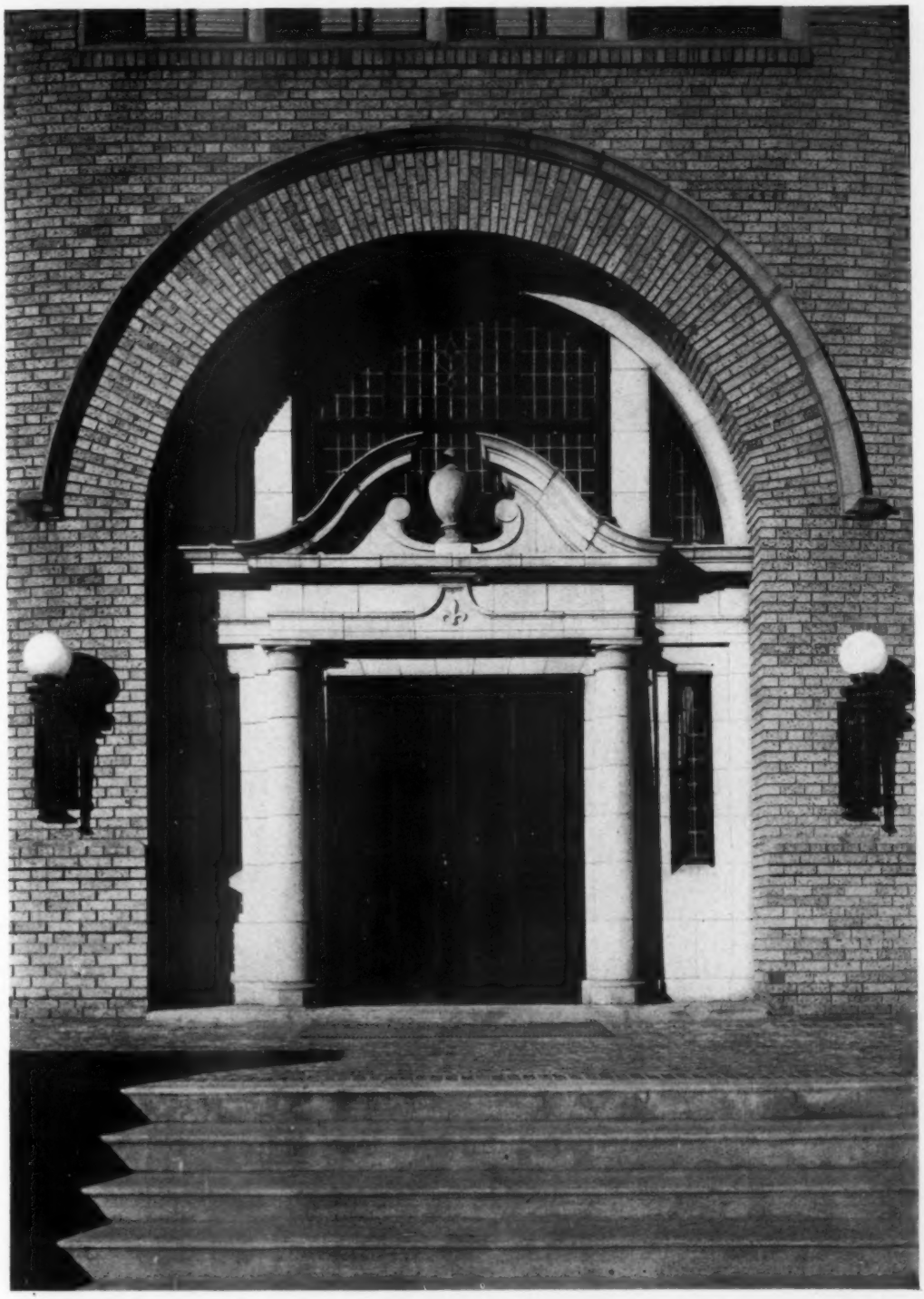
LIBRARY

HART HOUSE, UNIVERSITY OF TORONTO, CANADA

SPRATT & RALPH, *ARCHITECTS*



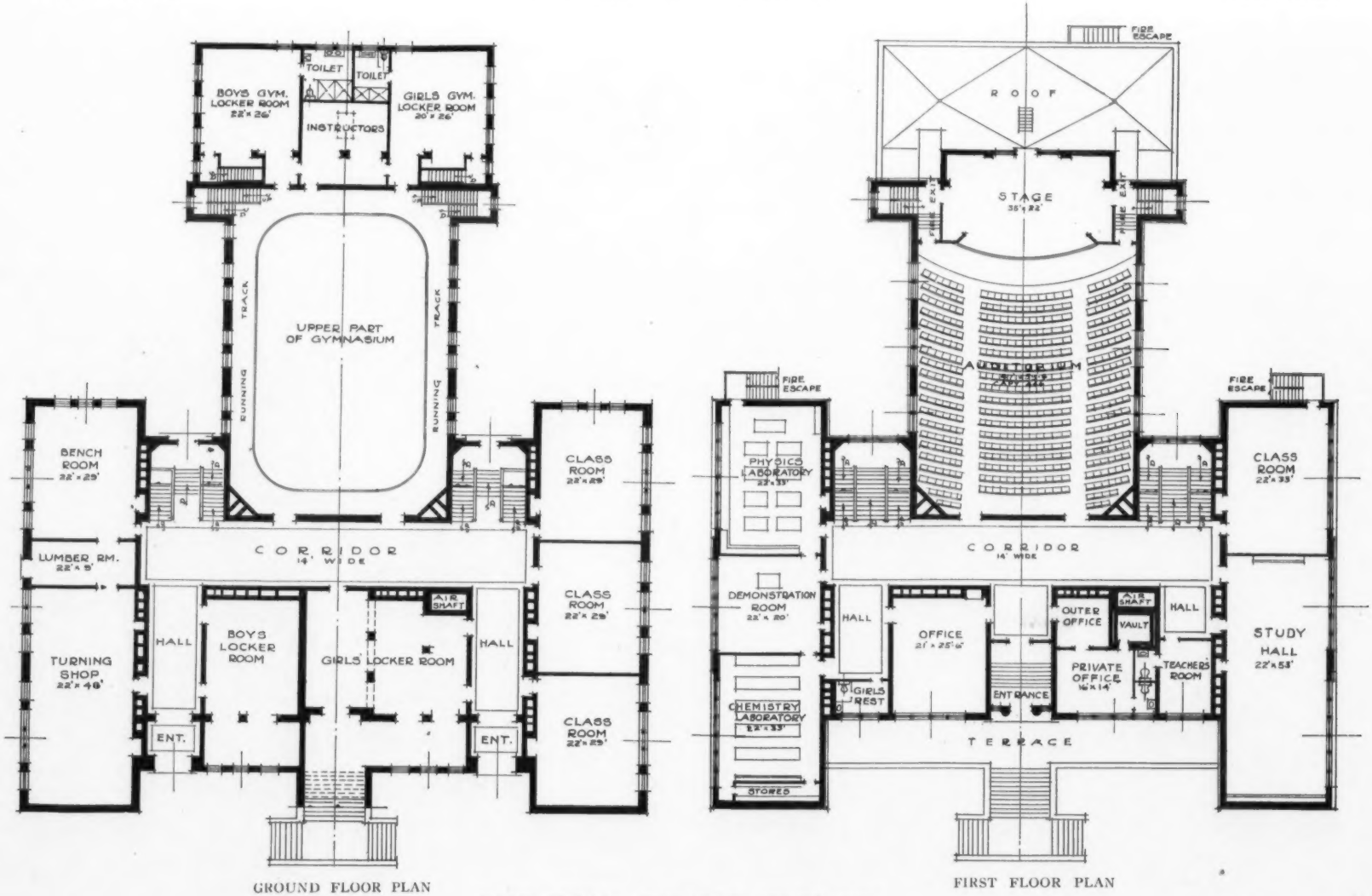
HIGH SCHOOL, DURANGO, COLORADO
CHARLES E. THOMAS, *ARCHITECT*



ENTRANCE DETAIL
HIGH SCHOOL, DURANGO, COLORADO
CHARLES E. THOMAS, *ARCHITECT*

AUDITORIUM

HIGH SCHOOL, DURANGO, COLORADO
CHARLES E. THOMAS, *ARCHITECT*

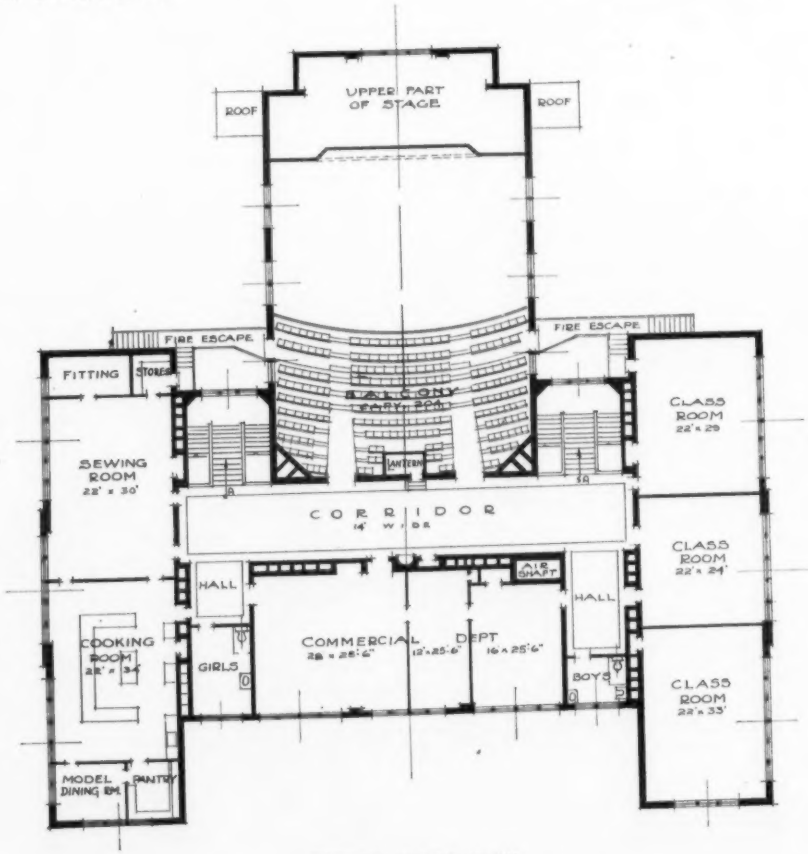


GROUND FLOOR PLAN

FIRST FLOOR PLAN

HIGH SCHOOL, DURANGO, COLORADO

CHARLES E. THOMAS, *ARCHITECT*



SECOND FLOOR PLAN
HIGH SCHOOL, DURANGO, COLORADO
CHARLES E. THOMAS, *ARCHITECT*

Several years ago the School Board of Durango authorized a survey of the school system to relieve existing congestion. Although Durango is a community of less than 5,000, it is the most important city in southwestern Colorado, a section which is isolated from the rest of the State by high mountain ranges, and reached only by a narrow gauge railroad.

Situated at the head of a large and fertile valley, Durango is an important distributing center for both the valley and the rich mining district immediately above it. These facts led to the recommendation of the erection of a first-class High School, which would not only serve the need of Durango, but establish an educational center for the entire district. The lack of a theater or any adequate assembly hall in the community led naturally to the recommendation that the building be planned to afford social center service.

The contract for the building was let in 1916, and the structure completed in 1917 at an approximate cost of $165,000, without equipment.

The plan of the building is the usual H shape, to which is added a rear wing containing gymnasium, plunge, and locker rooms, and auditorium, all of which are used by the community as well as by the school. For this reason the auditorium is treated as a theater rather than as a school assembly room. The other portions of the building are devoted to class rooms, study hall, laboratories, shops, and commercial and domestic science departments.

A complete system of heating and ventilating, with automatic regulation of humidity and temperature, is installed. The equipment of the building is in harmony with the structure.

The two years in which the building has been occupied have demonstrated the wisdom of the program, the attendance having already reached the limit of capacity, and the social center feature proven to be of greatest value to the community.

Current News

Happenings and Comment in the Fields of Architecture and the Allied Arts

Denmark Offers Prizes for Bridge Designs

According to an issue of *Politiken*, the municipal council of Aalborg, Denmark, will in the near future deal with a proposal concerning a new bridge across the Limfjord, to replace the present old pontoon bridge. The design for this bridge, to be the largest in Denmark, will be chosen by international competition. The competitors will be given free range in order to procure as many different solutions as possible. Thus any system, whether a pontoon bridge, an ordinary bridge, or a tunnel, may be considered. Prizes of 10,000, 6,000 and 4,000 crowns, respectively, will be offered for the three best designs.

England's Building Program Provides Work for 1,000,000 Men

In addition to the handicaps of high prices and scarcity of building material, England's efforts to catch up to the demand for dwelling houses are being seriously retarded by a shortage of some 200,000 workers in the building trades, due to the results of the World War. Talking to London newspaper men recently Sir Kingsley Wood, Parliamentary Private Secretary to the Minister of Health, pointed out that 60,000 of the 840,000 men engaged in building houses before the war had been killed, many thousands had been disabled and a host of others had gone into other trades.

Sir Kingsley went on to say that, including the 500,000 houses that the Government building program called for, there must be at least 1,630,000 dwellings put up during the next ten years in order to house the people at all adequately, and that there would be more than enough work for 1,000,000 men during that period. He said there was a shortage of 15,000 bricklayers in sight if the requisite number of houses were to be got under way this year, and that there was no prospect of any unemployment in the building trades, even if the workers now in the army were all to return to their old places.

Since the Government mapped out its building program the Ministry of Health has approved nearly 120,000 plans for new houses embraced in some 4,500 "schemes," covering about 37,000 acres of land in the leading cities of England. On February 20 Dr. Addison, the Minister of Health, laid the first brick in the Hayes building "scheme," the largest one under way in the Metropolitan district, which aims at constructing 2,000 dwellings. In his speech Dr. Addison defended the Ministry's policy in allowing adequate rents to be charged and pointed out that this was the proper way to avoid similar housing shortages in the future. The Minister opined that working folk ought to get wages enough to enable them to pay proper rents.

In the meantime the London papers are urging that Parliament hasten the drawing up and enactment of some kind of a rent act to take the place of the present one, which is due to expire on July 1, as otherwise tenants will have only their common law rights and may be ejected on due notice as in pre-war days. The present rent act, which was enacted last December as a substitute for the preceding measures which prevented landlords from ejecting tenants paying $350 or less a year rent, provides that no ejections from such premises may be made unless there is alternative accommodations available.

Would Bar American Architects

With a view to putting an end to American architects practicing in British Columbia, the architects of the province, states *Contract Record*, have a bill before the Legislature which provides incorporation for an architectural institute, and also protects Canadian architects. The clause which debars American architects from practicing is as follows: "An architect seeking admission under this act, who is a citizen of a foreign country or state, shall be admitted to practice architecture in this province on passing such an examination as may be prescribed by the council; provided that such foreign country or state of which he is a citizen recognize the standards of qualification set out herein on an equal footing with their own, and admit the members of this institute equally with their own citizens."

An Artists' Guild In Paris

There has recently been inaugurated in Paris the Syndicate of Graphic and Plastic Arts, organized for the defense of the legal and moral rights of artists, and for laboratory and research work. This has awakened American artists to the necessity of an American Guild based upon the same ideals.

According to word from Paris, the French Guild is at present agitating the granting, of authors' rights for artists; that is, the right to a continuing interest in the sale of works in order that there shall be no speculation in works of art bought at reduced figures on forced sales.

Remodeling in New York

The suggestion that New York City could find a solution of her housing difficulty in the remodeling of 33,000 apartments and houses now unfit for or unadapted to habitation ought to be received with reservations, retorts the *Globe* editorially.

The remodeling of buildings can be done properly or improperly. Experience dictates the casting of a decided vote against the method which ends with the installation of plumbing facilities, a few coats of paint or varnish, and the inevitable partition. On the other hand, to remodel properly requires time and money. It is estimated that the "improvement" of a block in Greenwich village, assessed at $530,000, will cost $500,000 and will

take until September 1. It is this sort of remodeling that New York buildings, now unfit for dwellings, will probably require.

The city may find the improvement of old buildings a part of its building program. It should not imagine, however, that the conversion of these into modern apartments will be a quick or inexpensive process. What the *Globe* believes is really necessary, as is indicated by Representative Amos's proposal for legislative action on the matter, is for the city to become a landlord on a large scale and at considerable expenditure of money in order to put through this entirely feasible but rather sizable undertaking.

When Lithographers Differ

An incident, not heretofore publicly recorded, of the recent "Joe" Pennell "quarrel evening," as it has been called, at the National Arts Club, when during a discussion on lithography and the graphic arts in general, in which Pennell outpoured his usual torrent of abuse on all craftsmen who differed with him, was the retort of George Bellows. Pennell remarked that Bellows should have drawn his noted illustration of the "Murder of Edith Cavell" directly from the scene on paper, and then transferred the sketch to stone. Bellows drily retorted, "I didn't have a ticket to that affair—neither did Rembrandt to the Crucifixion."

House Shortage Drives People from New York

The result of New York's failure to undertake and follow to a conclusion an adequate building program may be noted in the report of the Long Island Railroad. This road carried 34,000 commuters in February, more by 10,000 than the February of a year ago.

February is the month, comments the *Brooklyn Eagle*, in which every town worker who can find any sort of a place to live in town does so to escape the uncertainties of disarranged train schedules and the discomfort of tramping through snowdrifts. This year those uncertainties and discomforts were greater than within the memory of the present generation, yet the commutation figures on one railroad were 10 000 heavier than it had ever before known. It is estimated that something like 100,000 persons must be living permanently outside of New York City who would prefer to live there if they could find quarters.

The inconvenience to these Winter commuters is a serious burden, but that is not the worst of it. Taxes on the houses that they live in are paid outside of New York City, at a time when the burden of taxation there is staggering and when additions to its assessment rolls are needed as seldom before. A good part of their supplies are bought in their home towns, thus cutting down the volume of retail business done in New York. This depletion of the city's resources will go on increasing until means are found of building apartments on a large scale. If haste is not made, the families which now dwell out of the city on compulsion may have acquired the habit of country living and decline to come back. If that happens, New York will have exiled the goose which lays the golden eggs.

Aeronautical Research in England

The establishment of an Aeronautical Research Committee in the British Air Ministry and an Industrial Research Association for the aeronautical industry are recommended in the official report of a special committee on education and research in aeronautics, details of which have been received by the Bankers' Trust Company from its London correspondent.

Among the duties defined for these organizations are:

Advising the Air Ministry on scientific and technical problems relating to the construction and navigation of aircraft.

Assisting the aeronautical industry by scientific advice and research.

Preparing for approval of the Air Council a scheme of work and estimate of expenditure for the year.

Aeronautical education is considered, by the special committee, higher education which can only be given in institutions of university work. A department of aeronautics at Imperial College is suggested for the training of those who are to direct aeronautical research and the design and construction of aircraft.

Aircraft Fusion in Great Britain

Commercial interest in Great Britain has been considerably aroused, says the American Chamber of Commerce in London, by the announcement of the amalgamation of the Aircraft Manufacturing Company with the Birmingham Small Arms Company, Ltd.

There is a tendency to regard this fusion as indicating what is likely to happen in the British aeroplane industry generally in the near future, unless there is some immediate change in the situation. Aeroplane manufacturers are compelled, through lack of support, either to cease business altogether or to produce aeroplanes merely as a side line.

Commercial aviation in its present form does not offer strong inducements to business men. To make it an attractive proposition it must be greatly expanded. The relation between overhead and running charges is still disproportionately great.

War machines converted for commercial flying, the American Chamber points out, can at present carry passengers from London to Paris at 100 miles an hour at the rate of about 1/3d. a mile, while for goods transport the rate of 2/6d. per pound for a small parcel can be reduced to 1/6d. for a consignment of 75 pounds and over. Owing to the speed, the time saved is enormous. A passenger picked up in London at 11 a. m. should reach Paris before 4 o'clock. Parcels are delivered by air express well within a single day, and express letters travel between the two cities from door to door in about five hours. American business men on quick trips of investigation of British and continental markets have been heavy users of this service, which is a great time-saver for them.

Extended Interest in Highway Construction

The extent to which the people of the United States are committing themselves to a definite policy of highway development is shown by reports reaching the Federal Highway Council from all sections of the country.

In the face of high cost for both materials and labor, and the fact that in some states construction programs must be altered somewhat to meet existing labor and material conditions, there is no tendency upon the part of the people to slow down in their plans to place the nation's highways upon a higher plane in the country's transportation system. Tersely stated, "They are sold to the heels" on the proposition to construct highways that will release rather than restrict traffic, and they are dismissing labor and material problems with curt instructions to their official servants that it is up to them to deliver the roads.

A curious fact in connection with construction problems at the present moment is that the building of roads is seriously hindered by the same evil which they are designed to remove—lack of transportation. According to authoritative information, production is halted to a greater degree by inadequate transportation facilities than by labor shortage. At least this is true, it is claimed, in the production of materials for road building.

Highway officials—State and county, as well as national—are facing their duties with patience and tact, and out of a maze of trying situations, construction is going ahead at a fairly satisfactory rate.

Stonehenge to Be Protected

Stonehenge, now a national monument of the British people, is undergoing preservative treatment so that the gigantic stones may not topple over. In making a concrete foundation for one of the columns, no fewer than 125 rude implements of stone used in the original work of dressing the boulders came to light, together with a "pick" ingeniously fashioned from the antler of the red deer. Astronomical calculations give the date of erection of this great prehistoric work as 1680 B. C.

Cities Prepare for Future Air Traffic

About thirty cities have work in progress on the development of public landing fields for aircraft. The adaptability of the airplane to peace-time needs has demonstrated to men of vision that the airplane will in the future be used to the extent that landing facilities are available.

To be adequate, a municipal landing field must bear some relation to the main aerial routes. It must be so located that it will not later be shut in by tall buildings. It should be about 600 acres in size, and should be capable of expansion. It should be located close enough to other transportation facilities and to water-supply to permit any future development found necessary. It is not necessary that such a field be within the city limits.

Some of the cities already active include Albany, N. Y.; Scranton, Pa.; Flatonia, Tex.; Syracuse, N. Y.; Raleigh, N. C.; Jackson, Mich.; Bristol, Tenn.; Evansville, Ind.; San Antonio, Tex.; New Orleans, La.; Binghamton, N. Y.; Atlanta, Ga.; Kansas City, Mo.; Daytona, Fla.; Macon, Ga.; Cleveland, O.; Tucson, Ariz.; Montgomery, Ala.; Rochester, N. Y.; Baltimore, Md.; Detroit, Mich.

To Revive Industrial Art

The Society for the International Revival of Industrial Art, with advisory committees in London, Paris, Rome and elsewhere, has been formed under the leadership of Mrs. William Alexander for the purpose of encouraging and preserving the highest type of industrial art at home and abroad, and of bringing together the producers and those most interested in their works. The organization hopes to foster and preserve work of the best quality. "The society does not propose to act as sales agent for the actual buying and selling of industrial art," says its announcement, "but will establish in New York, and eventually other cities, offices, exhibition rooms and bureaus of information for the benefit of the lovers and buyers of art products."

Mrs. Alexander is president of the New York Committee; Mrs. Nina L. Duryea, vice-president; the Equitable Trust Company, treasurer, and F. Burrell Hoffman, secretary. The English Committee includes the Lady William Cecil, chairman; the Hon. Margaret Amherst, secretary; the Hon. Mrs. Walter Long and the Countess of Minto. Many members of the nobility are included among its patrons. The Belgian Committee is made up of Baron de Vink, Baron Kingud Littinkovo, and M. H. Dommertin. An exhibition, principally of fabrics and rugs from Morocco, has just been opened at 4 East Fifty-sixth street, where it is to continue for a short while.

The Discussion of Immigration Policies

At a meeting in New York of the Inter-Racial Council the various phases of the immigrant were discussed: his immigration, education and assimilation, and his naturalization.

Without much discussion the need of a constructive policy became apparent. Coleman Dupont, chairman of the board, said that we have actual need for the immigrant for the attaining a full development of our industries. Later a gentleman speaking for the farmers remarked the movement from the farms to the factories and the vacuum it had created in the production of food. It was further pointed out that there had been no organized encouragement of desirable immigrants, and when they arrived here they were treated in the most haphazard fashion; peasants of the land became factory operatives and mechanics became laborers.

Several gentlemen, some of foreign birth, were plain in the denunciation of the attitude of Americans toward foreigners as toward inferior beings, saying that the first point of attack in the Americanization of foreigners might be the instruction of Americans in their treatment of foreigners. A defense was made for the foreign language press on the ground that it is necessary to speak to people in the words which they understand, that there were many things in a strange country which needed to be explained.

Laws for the safeguarding of immigrants' savings were urged by Paul M. Warburg.

The numerous bills for the selection of immigrants were discussed by Louis Marshall, who approved of the exclusion of the mentally, morally and physically unfit, but questioned the advisability of selecting immigrants upon the basis of nationality or upon the matter of literacy.

There are always coat-room speakers. The representative of THE AMERICAN ARCHITECT was an audience of one to a Canadian journalist. "In my country," he said, "we encourage Anglo-Saxon immigration and we get on very well, but here one hears all languages spoken, and it is going to get you people into trouble. The speaking of anything but English should not be permitted, and as for bringing in more peasants from Europe—that would be a fatality."

The audience said: "Do you think so?" and he went on: "Of course, it is only a personal opinion, and I speak from the Canadian standpoint, but I have spent the past four years on the Continent (in service) and I know the sort of people you will get."

Many, no doubt, will share this Anglo-Saxon attitude of superiority and be sure in their belief that the Pole or Lithuanian or Swede who has "made good" in this country didn't have common sense until he learned English; or, at most, that he had a feeling of superiority over his race which led him to learn English.

Mr. Hambidge's Measurements

Intensely interesting though it undoubtedly was, Mr. Hambidge's paper, read at the Royal Institute of Architects recently, did not, one may imagine, make many converts to his theories, states the *Architects' Journal* of London. His facts, however, are indisputable. He has been at great pains to gather them, and they prove his uncommon power of patient research, even if they fail to show that the proportions he has found to prevail in beautiful buildings were designed deliberately and mathematically, instead of being coincident and spontaneous expressions of the sense of beauty.

Personals

Ralph Mornington Weinrichter, F.A.S.L.A., landscape architect of Rochester, New York, announces the opening of a New York office at 10 East Forty-third street.

The withdrawal of G. Evans Mitchell from the firm of Frank, Wagner & Mitchell is announced. The business will be continued under the name of Frank & Wagner, at 46 South Broadway, Akron, Ohio, associate architects with George B. Post & Sons, New York.

National Lumber Manufacturers' Association announces the removal of its general offices from 925 Lumber Exchange to Suite 750 McCormick Building, 332 South Michigan avenue, Chicago.

Samuel P. Hall, architect, late of the Construction Division, U. S. Q. M. C., and Harold M. Bush, mechanical engineer, late Colonel of Field Artillery, A. E. F., have formed a partnership for general architectural practice, with special reference to factories and industrial plants. They have established connections with Henry V. Hubbard, professor of landscape architecture. Offices are at 16 South Third street, Columbus, Ohio.

Edward C. Van Leyen and Edward A. Schilling, architects, and Henry J. Keough and Robert A. Reynolds, engineers, have associated under the name of Van Leyen, Schilling, Keough & Reynolds for supplying complete service in architecture, engineering and supervision, and announce their removal from the Union Trust Building to 556 Cass avenue, Detroit, Mich.

H. B. Mulliken, architect, announces that he has moved his office from 103 Park avenue to 609 West Forty-eighth street, New York.

News from Various Sources

The new Calistoga High School, Napa County, Cal., will be heated by natural hot water from one of the big Calistoga hot water wells. The water will then be cooled for drinking and irrigation purposes. Considerable expense will be saved, as the water rises in the well about twenty feet above the surface of the ground and will flow throughout the building by gravity.

* * *

The Free City, by Bouck White, has been published by Moffat, Yard & Co., New York, advocating the City Republic, the Community State and filling in the picture of this ideal with epigrammatic description.

* * *

Housing and Housing Problems are discussed by Carol Aronovici, Ph.D., director of housing, California State Commission of Immigration and Housing. The social and economic principles involved in providing facilities for the highest possible standard within the reach of the largest proportion of people are presented.

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The results of an investigation covering substitutes for the saloon have been prepared by Raymond Calkins, with a valuable introduction by Francis G. Peabody.

* * *

George B. Ford has published a book, "Out of the Ruins," describing his observations in the Red Cross service in France. Recent laws affecting reconstruction are made clear.

* * *

A treatise on Education in Accident Prevention was prepared by E. George Payne, Ph.D., at the request and with the approval of the National Safety Council. Gives practical methods of teaching safety in the regular courses already given, without the addition of a new one.

* * *

Preliminary plan for a housing project was issued by War Civics Housing Committee to interest the industries and citizens of East St. Louis in the housing problems of the city. Address the committee, 331 Federal Building, East St. Louis, Ill.

* * *

A pamphlet of thirty-two pages is presented by the National Works Department Association, telling why the Government should have a Department of Public Works which would organize the many and varied public works functions of the Federal Government, now scattered through nine separate departments and thirty-nine bureaus and services. This association urges the passage of the Jones-Reavis bill to create such a department. Address the Association at 502 McLachlen Building, Washington, D. C.

* * *

An illustrated bulletin (No. 816 of the U. S. Department of Agriculture, January 19, 1920), of fifty-eight pages, prepared by F. L. Mulford, horticulturist of the Office of Horticultural and Pomological Investigation, shows the kinds of trees suitable for city streets, their planting, culture and care. Apply to the Government Printing Office.

* * *

Bulletin No. 5 of the series "Community Buildings as War Memorials," published by the Bureau of Memorial Buildings, War Camp Community Service, 124 East Twenty-eighth Street, New York, N. Y., 1919, thirty-nine pages. Illustrated descriptions of auditoriums in a number of cities. Address the bureau, as above.

Summary of Program of Architectural Competition for the Remodeling of a New York City Tenement Block

The Joint Legislative Committee on Housing and the Reconstruction Commission of the State of New York present the problem of remodeling a characteristic old tenement block in New York City. The object is two-fold: to find the best method of improving living conditions in the old-law tenements without destroying the buildings and to find a plan for remodeling that will encourage such alterations by the demonstration of its economic wisdom. The relation of costs to results will be a predominating factor in the judgment. The purpose of the competition is to find solutions that will be applicable not only to the block which is the subject of study but also to similar blocks throughout the city.

Competitors may decide what size units, what type and size of tenement, apartments, rooms, courts and yards will give the proper environment for decent living and the most practical result as to plan, management and financing. For the study the block bounded by Rutgers, Madison, Jefferson and Monroe Streets, Manhattan, has been chosen. Two plans of the block are supplied to competitors; one of the ground floor and the other of a characteristic floor of the apartments; also the elevations of the four street fronts. The following two drawings are required: A plan of the first floor and a plan of a characteristic floor and only one other drawing may be submitted which shall consist of a bird's eye view of the whole or part of the development.

In addition to the drawing each competitor is required to submit a description. It should contain the following: (1) An explanation of the advantages of his solution from the point of view of the tenants, owners, the community and the State. (2) The proposed methods of carrying out the alteration; in small or large units, by individual owners, groups of owners, assistance of the local community, city or State. (3) A brief description of materials, type of lighting, plumbing, heating to be used in alteration. (4) Any proposed scheme of management. This includes care of houses, heating, lighting, rentals, as well as any common facilities for the use of more than one family or one house. (5) Comparisons of existing and altered block: (a) Number of apartments. (b) Number of rooms. (c) Conveniences. (d) Sanitation and ventilation. (e) Rental values.

The drawings and description are to be marked with an emblem, the description placed in a sealed envelope, marked on the outside with the same emblem. These shall be accompanied by a sealed opaque envelope containing a card on which shall be the name and address of the competitor. All drawings and descriptions must be delivered at Room 302, Hall of Records, New York, on or before 1 o'clock June 15, 1920. The competition is open to any person.

There are prizes offered, two of $1,000 each, four of $500 each, and four of $250 each. The jury holds the right of publishing or exhibiting any drawing or description that may be submitted.

The judges of the competition will be: Mr. Allan Robinson, Mr. Alfred E. Marling, Mr. Edgar A. Levy, Hon. Frank Mann, Mr. Clarence S. Stein, Senator Charles C. Lockwood, Senator John J. Dunnigan, Mr. Andrew J. Thomas, Mr. Burt Fenner, Mr. Robert D. Kohn, Miss Lillian Wald, Mr. Alexander M. Bing.

Until April 15th questions will be answered if sent to Clarence S. Stein, Secretary of the Housing Committee, Reconstruction Commission of the State of New York, Room 302, Hall of Records, New York City.

Two methods have been suggested as a practical means of refurbishing the old tenement districts; one is to tear down the present structures and replace them with new buildings, the second is to alter the existing structures to make them wholesome places to live in. With the present costs of building, it is impracticable to attempt the first method on a large scale if the same end can be attained by remodeling the old buildings. In March, 1919, of the total of 982,926 individual apartments in New York, 587,851 were in old law tenements; that is to say that they may be expected to be detrimental to the health of the community and a poor financial investment. The process of their destruction is slow. In ten years up to March, 1919, 58,552 apartments were destroyed. At this rate it would take 100 years for them to disappear.

Most of the owners of the old houses have had slight if any return from the money invested. Rentals are low and the tenants constantly moving. There are a large number of vacant apartments; in March last 19,110 old law apartments were vacant and they were with few exceptions unfit for human habitation.

Most of the defects of the old tenements are due to poor planning. Their more obvious faults are: (1) The lack of sufficient air and light—a large part of the rooms have no direct opening on the outer air. They are lighted and ventilated by opening into adjoining rooms. Others have windows on small shafts or narrow interior courts. Many of the families still live below the level of the sidewalk. (2) The toilet facilities are without proper light and ventilation and used in common by more than one family. (3) There are bad odors resulting from the ventilation of toilets on courts, shafts or corridors on which living or bedrooms open, and from the use of the courts as a receptacle for garbage. (4) Dumbwaiters, where they exist, are always nailed closed, and food and coal (each apartment is heated individually, excepting in the new houses) must be hauled up four or five flights. The garbage and ashes when not thrown down the shaft must be carried down to the ground floor. There are not enough sinks or wash tubs. There are practically no bath tubs in the poorer parts of the city. (5) The lack of privacy endangers both decency and health. This is due to bad planning and is accentuated by overcrowding. (6) The neglect and decay into which the houses have fallen are due to age and lack of proper care of the house. (7) There is absence of adequate play or recreational space which gives a dreary, unwholesome environment for the homes. (8) There is a lack of proper protection against fire.

Weekly Review of Construction Field

Comment on General Conditions of Economics With Reports of Special Correspondents in Prominent Regional Centers

THE event of greatest moment in the past week is the so-called "outlaw" strike in the transportation system. Just what force such a strike will have in the development or clarification of the labor situation is a subject for speculation; but this is a speculation which doesn't get one very far.

The most disturbing feature of the manifestation is the closing of factories. After a survey of the large industrial plants of Detroit, the Employers' Association of that city announced that 110,000 men are forced out of work. In Pittsburgh 200,000 men were idle—mostly in the steel and coal industries. Three coal companies of Scranton and the mines of Carbon County, Utah, were compelled to close for want of cars. Because of a coal shortage 100,000 men are reported out of work at Columbus. There can be no section of the country which does not suffer the unfortunate effects of this strike.

And with these men out of work, even though it last but a few days, our backward production is still further held up. The costs and complicated losses accumulate like an avalanche with a waste which at this time is horrible to contemplate.

Liberal opinion has stood out for the right to strike, saying that without such right labor gives over its only weapon. This may or may not be true; it is barely possible that we have still in this country a sense for justice or for general well being which in the long run will prove to be more powerful than the detailed attacks made upon it, however organized or forceful, whether of labor or of capital. The point of view of liberal opinion seems rather narrow in its perspective of the forces at work.

On the other hand, the Poindexter bill is under consideration by the Senate Interstate Commerce Committee. It is a bill which would impose heavy fines and imprisonment on persons persuading railroad employes to quit work when by so doing they would tie up transportation. The Edge bill, also in the Senate, makes it a misdemeanor for a railroad employe to quit singly or in combination with a substantial number of his fellow employes for the purpose of obtaining more favorable working conditions. There is a third bill presented by Senator Freylinghuysen which embodies the anti-strike provisions that were stricken from the Cummins Railroad Bill.

OF a more helpful nature is the appointment of the Railroad Labor Board, which is not merely to act upon the particular occasion of dispute now to the fore, but is in control for years. It is a court of appeal in which is represented all three parties of interest: the employes, the managers and the public. And it is well that the decision now desired should not be arrived at hastily through a balance of powers, but by a legitimate decision of the merits of the case. The factors at issue are complicated and far-reaching and the solution should be, by its justice, of value in solving the other labor controversies and disagreements which are involved with the same or similar questions.

A statement from the employes says: "In determining the justness and reasonableness of such salaries so far as applicable we have taken into consideration, among other relevant circumstances, the following: (1) The scale of wages paid for similar work in other industries. (2) The relation between wages and the cost of living. (3) The hazard of employment. (4) Training and skill required. (5) The degree of responsibility. (6) The character and regularity of employment. (7) Inequalities of increase in wages or of treatment, the result of previous wage orders of adjustment." Certainly, the Railroad Labor Board assumes a difficult responsibility.

A few months ago the American Federation of Labor expressed its interest as an organization in politics. Its wishes were not very definitely expressed except that it would support such legislators as looked out for its interest. It is now announced that the National Association of Manufacturers will enter the national political campaign with a "platform for American industry," to be submitted to both the Republican and Democratic conventions. A committee of three representative manufacturers from each State will meet in New York to draft a definite platform for industry which is to be voted on at the twenty-fifth annual convention of the association May 18th.

The effort is made to select manufacturers which reflect not only the sentiment of their particular industry, but the industry of the individual States. A letter sent to the various State organizations says: "It is now the duty of productive industry to present to the country a sound, economic program. Never before have associations like ours had the opportunity to prepare jointly such a program."

It is indeed time that industry explained its position and its needs. The assumption that manufacturing is wholly to the benefit of the owner should be corrected. The industries may be privately owned, but they are all engaged in producing for common consumption and their development and improvement benefits the great body of consumers.

France has long furnished State aid in the construction of cheap dwellings and the acquisition of small holdings of land. The interest of such money is 2 per cent, or if the buildings or land is to be rented out, the interest is 2½ per cent. The provinces and communes are authorized to purchase and resell lands for this purpose which are subdivided into lots not exceeding a quarter acre. The price of such a homestead must not exceed 10,000 francs. Such funds may also be drawn on to complete buildings already in the course of construction.

Property so acquired cannot be transferred for ten years and if purchased for a home it cannot be used for any other purpose. The purchaser must engaged to cultivate the land either by himself or with the help of members of his family. When lands have been purchased by the province and divided into lots, plans are placed in the office of the prefecture and the branch offices of the province and are open to the public for two months. The price of each lot is given. In awarding the lots, consideration is given to the morality of the applicant and the number of children in the family and preference is given to those who have arranged for long term loans.

DEPARTMENT OF ARCHITECTURAL ENGINEERING

Clocks, Historically and Architecturally Considered

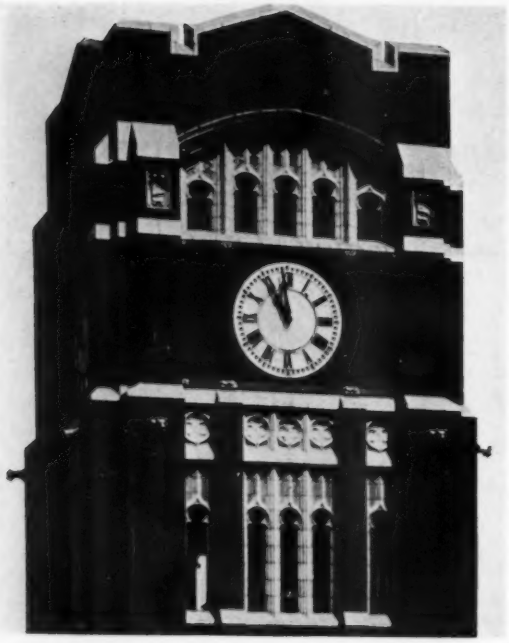
Part Two—Modern Developments

MODERN business conditions make it absolutely essential that synchronized time be in common use. Even at this time one can traverse a street in any city and find clocks varying to a very marked degree. This variation in the time indicated by clocks is the source of annoyance and often is the cause of loss in business transactions. Naturally there is a general feeling of uncertainty when accurate time is involved and this can only be overcome by a more general use of time pieces of precision.

Clocks have, in most instances, been classed as furniture and the planning for their use and their selection has been neglected by architects. In many cases their selection is made with too little consideration of the service to be rendered and the quality and design of the clock mechanism. The increasing use of clocks and the cost of time installations is making it necessary for architects to inform themselves as to all of the factors involved in this particular branch of building equipment. With the improvement in the design of clocks more uses for them develop and it is very probable that the item of clocks will receive the same attention as that given to lighting, vacuum cleaning, ventilating and other mechanical apparatus and devices. The ease with which clocks are installed, their dependability and moderate cost, is causing them to be considered indispensable in many places where they were formerly considered not even necessary or desirable.

CARRIAGE FACTORY, C. P. KIMBALL CO., CHICAGO. GEO. C. NIMMONS CO., *ARCHITECTS*

The modern electric clock system service in-



CLOSE-UP VIEW OF CLOCK TOWER, CARRIAGE FACTORY, C. P. KIMBALL & CO., CHICAGO.
GEO. C. NIMMONS & CO., *ARCHITECTS*

cludes the clock, programs and alarm service, time recorders and time stamps. All of these are controlled by a master clock with which they synchronize. The secondary clocks are placed in any position desired and are in movable cases or built in the walls with only the glass face and its enclosing case projecting from the wall surface. Free-standing desk or mantel clocks can be placed where desired by providing the proper electric connections. By the use of program clocks any desired system of alarms, by means of bells, gongs, buzzers, lights or whistles can be operated and at any stated time desired. The number of programs is not limited and the service is very flexible, easily modified and controlled.

Exterior clocks in towers, pediments and projecting cases are also controlled by means of master clocks when desired. There is no limit to the number of places where such clocks are used and they are often important features of the architectural design. In fact, the clock can be made an important element in any design, whether interior or exterior. Time recorders are a secondary clock so arranged that the time when the recording apparatus is operated is indicated on a card or ticket. Their use is generally for the purpose of registering the time at which persons enter or leave a place of employment. They are usually reliable in correctly indicating time, but many possess decided advantages in the difficulty of operating them fraudulently. This is an important feature as fraudulent operation is the source of great loss in wages paid for services not rendered.

A time stamp is a device which indicates on a paper the time at which the apparatus is operated. These are used to record the time at which documents, letters, telegrams or memoranda are received or dispatched. Their use is of importance as a means of establishing the time at which events or transactions take place.

The clock is used on places of residence, places of business, public institutions, governmental buildings, schools and many other situations.

Residential use is not common as yet and this is due evidently to a lack of knowledge of the service to be secured. When the dwelling is thought of, it is not usually accompanied by the idea of clocks as a necessity. This is not as much a necessity as it is a convenience. In the detached house of large size with several service buildings, it can be made a very important feature in the routine of its operation and use. The master clock, of the astronomical regular type, is easily made a "grandfather" clock, placed in the hall, living room or library. The case of this clock should be designed to conform to the style of the interior finish and decorations, in fact designed as a part of the room and not as a movable fixture. The secondary clocks,

CLOSE-UP VIEW OF CLOCK TOWER, SEARS ROEBUCK & CO. WAREHOUSE, SEATTLE.
GEO. C. NIMMONS & CO., *ARCHITECTS*

VIEW SHOWING THE METROPOLITAN TOWER, MADISON SQUARE, NEW YORK CITY

MESSERS. N. LE BRUN & SONS, *ARCHITECTS*

located with reference to the architectural treatment of the room, are an admirable fixture in the living room, library or dining room. When the mechanism is housed within the wall structure, the dial can be designed as the center of an ornamental treatment surrounding it and with a distinct

WAREHOUSE, SEARS ROEBUCK & CO., SEATTLE, WASH.
GEO. C. NIMMONS & CO., *ARCHITECTS*

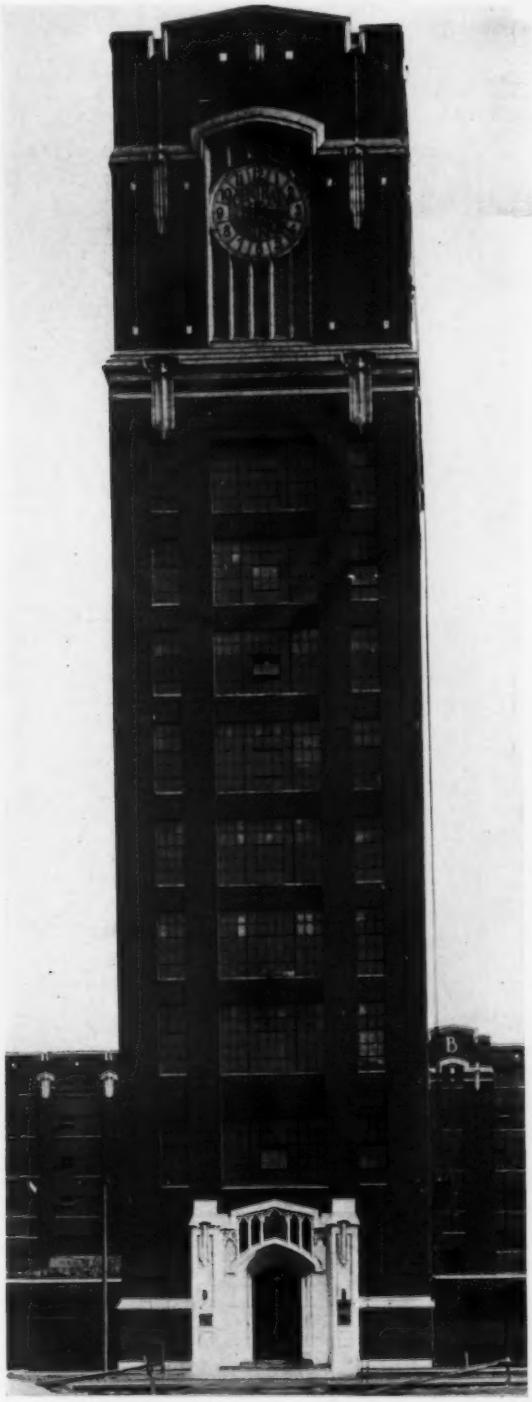
relation to the general design of the room. In the library, which is often used in a manner comparable to an office, a desk clock can be installed on the library work table or mantel. A smaller and more ornate desk clock would be a suitable part of the boudoir equipment. In the kitchen and servants' quarters smaller and more plain clocks are desirable; these may advantageously be equipped with a program or alarm service. This alarm service is identical in effect to that furnished with the ordinary alarm clock. The main bedroom clocks can also be supplied with the alarm service and in addition have the hands and numerals coated with a radium compound which makes the reading of the time easily accomplished in the dark. These bedroom clocks especially, as well as the other secondary clocks, should be absolutely noiseless in operation. A suitable clock service can be extended to the garage, gardener's house and other service buildings. As a convenience, such a system of clocks is comparable to a complete telephone installation. Other residential buildings such as apartment houses, clubs and hotels can be equipped in like manner. The club and hotel require the use of the time recorder for the employees and the use of time stamps to be used on letters, telegrams, memoranda of telephone calls and of all other matters in which a record of the exact time of receipt or sending out is of importance.

In addition to this, the modern hotel is being equipped with a noiseless secondary clock in each guest room, this clock being equipped with the alarm attachment and radium compound coated hands and numerals. It is customary to operate the clocks on each floor through a secondary master clock located on each floor. By this arrangement, systems with as many as a thousand clocks have no more effect on the master clock than a system of a dozen secondary clocks directly connected with it. There is scarcely a feature of hotel service that is better appreciated than a clock service as described and the demand for it by hotel patrons is extending the use of such service very rapidly. This same condition is applicable to the better class of apartment buildings. In this type of building, the clock system is but an added feature of service which followed, very naturally, the now common services of lighting fixture and light, heat, window shades, refrigerators or refrigeration, vacuum cleaning service, gas stoves, laundry equipment, telephones, elevators and all the other things that competition forced into use. The clock system is but a logical extension of service.

In office buildings where there are tenants who acquire time stamps and time recorders in the conduct of their business, the secondary wall and desk clock is also a necessity. Where office buildings are equipped to supply this service a rental charge is made which yields a handsome return on the investment.

The leading school authorities recommend the installation of clock systems in school buildings.

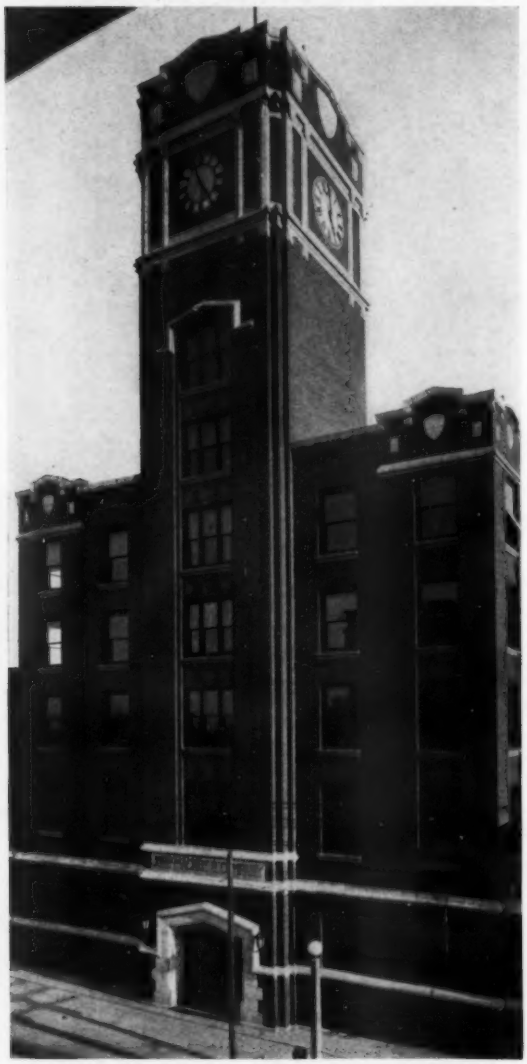
WHOLESALE GROCERY HOUSE, REID, MURDOCK & CO., CHICAGO. GEO. C. NIMMONS & CO., *ARCHITECTS*



THE TOWER BUILDING, CENTRAL MANUFACTURING DISTRICT, CHICAGO. S. SCOTT JOY, *ARCHITECT*. This building serves primarily to house the tanks which supply the sprinkler systems in the adjoining buildings. The offices of the architectural, engineering and construction departments and the local offices of the Central Manufacturing District are also located in this building

TWO CHICAGO CLOCK TOWERS

This accustoms the pupils to observe time and be guided by it and has a tendency to develop the habits of promptness and regularity. The use of the program clock insures a regularity and uniformity of operation that can be secured by no other means. Other buildings of public nature,



JOHN MAGNUS & CO. BUILDING, CENTRAL MANUFACTURING DISTRICT, CHICAGO.
S. SCOTT JOY, *ARCHITECT*

such as city halls, court houses, eleemosynary and penal institutions find clock systems, and often programs, a necessary adjunct to their operation. The modern hospital also requires a dependable system of clocks throughout and in some places special service, as in the operating room, where the clock has a full attachment which strikes each fifteen seconds when desired. This service is to aid the attendant accurately to count the pulse of the patient during the operation. In the rooms and wards a noiseless clock is necessary.

The modern factory has a complete time system installed in all the buildings, consisting of secondary clocks, time stamps and time recorders, which are controlled by one master clock. All big modern machinery is equipped with a counter which records the number of operations as well as the elapsed time. The printing press and the binding machine thus record the number of papers printed or books bound and also the time during which the work was executed and the operations of other kinds of machines are recorded to show the number of operations occurring during the day. These recorders and regulators are connected with the electrically driven system.

In banks the clock system, and especially the time stamps, have long been recognized as a necessary safeguard to the operation of the business.

On approaching a railroad station, the majority of people are concerned with the time. For that reason large tower and other exterior clocks are seen from all avenues of approach. In the interior, secondary clocks are placed in all rooms and in all corridors and passageways. Time recorders and time stamps form a necessary part of the equipment.

The exterior clock, either in the tower or attached to the wall of a building, may not bring a direct benefit to the owners through any influence on the occupants. It does have a certain value because the building is looked to by persons who pass and this gives the occupant and the building a certain publicity that it would not otherwise attain. It is usual in these times to enclose the water tanks and other utilities within a tower, thus adding to the architectural importance of the building. These towers afford a splendid opportunity for the installation of clocks, and clock towers are becoming more common in manufacturing and mercantile buildings than any other class of structures.

The art of clock-making has been carried on in America from the early days of its settlement. American clock makers have kept apace in all the developments of the art and are probably paying more attention to the perfection of the mechanism than to the artistic designing of the cases and dials. Ever since the advent of the electrically operated and synchronized clock much attention has been given to their improvement and in extending the field of their service.

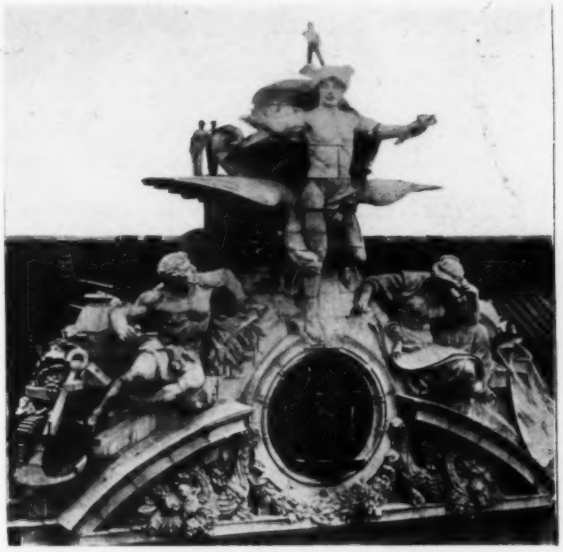
The firm manufacturing the oldest American

made clock has specialized on tower clock movements and has also developed a master and secondary clock of the most excellent workmanship and materials. The makers of another clock, the product of about ninety years' experience, produce a master clock which is a very high class astronomical regulator and controls the secondary clock system.

The self-winding clock is one of the most modern of the electrically driven clocks. It was formerly operated by air pressure but this system was abandoned for the more satisfactory system of electric control. The secondary movement is of a high class and was the only noiseless movement up to 1919. It is used largely in connection with the Western Union Service.

The latest synchronized clock system to be perfected and placed on the market is controlled by a master clock that is practically an astronomical regulator, and is the only one that runs on ball bearings. The secondary clock is the smallest and of the most simple construction, having no springs but being driven by a self-cleaning interlocking worm gear movement. This is accurate and noiseless and a single mechanism is so constructed that when placed in a partition, a dial can be operated on each side of the wall, this effecting a considerable saving in the cost of installation and in maintenance and operation.

Architects are beginning to realize the importance of clock systems. It is yet the custom, to a large extent, to install the clock system after the building is completed. This cannot give the best service and is more expensive in installation.



CLOCK TOWER GROUP, ASSEMBLED, GRAND CENTRAL STATION TERMINAL, NEW YORK CITY.
WARREN & WETMORE, *ARCHITECTS*

There is no reason why the outlets and wiring for a complete clock system should not be planned and installed in exactly the same manner that lighting, telephone, vacuum and other systems are now taken care of. At this time no one would consider the omission of providing for these utilities and to accord the same treatment to the electric clock system is well worth the architect's consideration.

BUILDING FOR THE CONTINENTAL CAN CO., CENTRAL MANUFACTURING DISTRICT, CHICAGO.
S. SCOTT JOY, *ARCHITECT*

The Future of the Construction Division, U. S. Army

Shall It Become Part of the Proposed Department of Public Works?

IN May, 1917, the Construction and Repair Division of the Quartermaster General's Office was separated from the jurisdiction of the Quartermaster General, except in certain minor details, and to all intents and purposes became a separate corps. This was occasioned by the pressing necessity of providing housing facilities for the new armies which were rapidly being drafted and sent to training camps, as well as the necessity of construction of shops, factories, storage and terminal facilities to meet the transportation and overseas shipment requirements of the army.

The Construction Division was composed of never more than three regular army officers and of the very pick of the engineering and constructional civilian brains of the country. These men came in to help in this immense work and built up an organization at the head of which was Brig.-Gen. R. C. Marshall, and which conducted simultaneously 581 separate building operations and employed more than 400,000 men at one time in their construction. Not only did this organization construct cantonments with all their utilities, storage warehouses and depots, but it also built many ammunition and chemical manufacturing plants, as well as factories and factory additions for the manufacture of motors, tanks and ordnance.

In October, 1917, the operation of the cantonment utilities was also placed on the shoulders of this division, as it was found impracticable to keep the construction of cantonments and the operation of their utilities separate.

The operation of utilities is a skilled and highly technical business. It requires the services of men with much experience in this work if effective operation is to be had. The Construction Division has in its employ many skilled utility operators and managers. And so the work of the Construction Division is not finished. It is safe to assume that there is a hundred million dollars' worth a year for it to do for an indefinite period.

There are at present three plans being considered for the future of the Construction Division. The first one suggested has been to transfer it to the Corps of Engineers. This has been rejected, because the Corps of Engineers is not qualified by training or by experience to operate such a division. They have no men who are trained in building construction or in the operation of utilities. No work which the Corps of Engineers does or has done has fitted them for such a job as this. The Engineer Corps has never in the history of the country had to do with the construction work of the army or with the operation of its utilities. The proposal to transfer this division to the Engineer Corps would then be to put civilian work totaling a hundred million dollars a year into the hands of men with no training and experience along these lines. The absurdity of this proposal has been finally realized and it is not now actively before Congress.

The second proposal is to transfer this division back to the Quartermaster Corps. There are serious objections to this. In the first place, it is a civilian corps made up of civilian engineers who are specialists in their line. These men are not willing to go into the Quartermaster Corps as reserves and run the risk of being assigned to work for which they are not qualified, but they would continue to be immediately available if the Construction Division is given an independent status. The Quartermaster General's Office was a large and important one before the war and yet its expenditures, including the pay of the army, were less than $100,000,000, which is a conservative estimate for the amount of work the Construction Division will be called upon annually to do. The work of the Construction Division is highly specialized and had no particularly intimate relation to the other work of the Quartermaster Corps. In order that such a division may function effectively it must have an independent status. If it were transferred back to the Quartermaster Corps and made a sub-division of a sub-division it would be seriously handicapped, for if effective decisions are to be made, the responsible executive must have immediate access to the officer exercising the final authority, who in this case is the Secretary of War or his representative on the General Staff.

The Construction Division, then, should be given an independent status, should maintain its wonderful organization and "esprit de corps" intact. It should finally be transferred bodily from the War Department to the proposed Department of Public Works. It is work of a strictly non-combatant nature. Army methods and army experience are absolutely unnecessary to its proper functioning and its personnel is made up of trained civilian engineers and constructors. This division would be thoroughly at home in the Department of Public Works and it is the earnest desire of the architectural and engineering profession that it be eventually included in such a department.

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The STRUCTURAL SLATE COMPANY

PEN ARGYL **PENNSYLVANIA**

Late Quotations in Building Material Markets

(Price quotations now current on building materials and supplies as quoted by dealers and jobbers for delivery in New York, Chicago, San Francisco, Seattle, and Birmingham follow. The quotations set forth are placed before readers of THE AMERICAN ARCHITECT to afford an accurate review of market conditions, rather than for use as a basis for actual purchase. They will not only provide knowledge of the exact state of the market as to items quoted, but will also present a basis to judge conditions as affecting correlating materials.)

	New York	Chicago	San Francisco	Seattle	Birmingham
BRICK					
Common	$30.45	$14.00	$18.00	$20.00	$28.00
Face brick	55 00 to 60.00	30.00 to 40.00	60.00 to 62.50	65.00	45.00
BURNED CLAY (Delivered on Job)					
Block partition:					
3 in., per sq. ft.	0.13	0.10	.....	0.10½	.....
4 in., per sq. ft.	0.15	0.11	.....	0.10	.....
Wall coping (single slant):					
8 in., per lin. ft.	0 16	0.22	.....	.....	0.22
12 in., per ft.	0.26½	0.33	.....	.....	0.32
18 in., per ft.	0 54	0.66	.....	.....	0.52
(Corners and angles four times the price of one foot of coping the same size)					
CEMENT					
Per bbl. in 15-cent bags (rebate 60 cents per bbl. for bags)	3.80	3.25	4.00	....	4.50
FINISHED IRON AND STEEL (Mill Shipments)					
Bar iron, refined grade	.....	.....	.....	6.00	.....
Bar iron, double refined	.....	.....	.....	.....	.....
Soft steel bars	2.62 to 4.52	.....	.....	6.00	4.00
Shapes	2.72 to 4.27	.....	.....	6.00	.....
GLASS (Discounts from Manufacturer's Price Lists)					
Single strength, A quality, first three brackets	75%	77%	.....	.....	.....
Single strength, B quality	75%	77%	.....	83%	.....
Double strength, A quality	77%	79%	.....	83%	.....
Double strength, B quality	79%	79%	.....	.....	.....
GYPSUM					
Plaster board:					
27x28x1	.....	.....	.....	.....	.....
27x48x ½	0.45	.....	.....	.....	.....
32x36x ¼	0.28	0.24	.....	.....	0.40
32x36x ⅜	0.29	0.26	.....	0.36	.....
32x36x ½	0.35	.....	.....	.....	.....
Plaster blocks:					
2 in. solid, 12x30, per sq. ft.	0 13	0.12	.....	.....	.....
3 in. hollow, 12x30, per sq. ft.	0 13	0.12	.....	.....	.....
4 in. hollow, 12x30, per sq. ft.	0 14	0.13½	.....	.....	.....
6 in. hollow, 12x30, per sq. ft.	0.21¾	0.20	.....	.....	.....
HOLLOW TILE					
2x 8x12 partitions, per 1,000 sq. ft.	.....	.....	80.00	.....	.....
3x12x12 partitions, per 1,000 sq. ft.	.....	110.00	108.00	105.00	112.00
4x12x12 partitions, per 1,000 sq. ft.	.....	118.00	125.00	120.00	126.00
6x12x12 partitions, per 1,000 sq. ft	.....	162.20	154.50	170.00	168.00
8x12x12 partitions, per 1,000 sq. ft.	.....	221.10	222.50	230.00	224.00
10x12x12 partitions, per 1,000 sq. ft.	.....	272.70	276.00	.....	.....
12x12x12 partitions, per 1,000 sq. ft.	.....	316.90	.....	.....	.....
2x12x12 split furring, per 1,000 sq. ft.	.....	73.80	108.00	.....	.....
LATH					
Eastern spruce, per thousand	18.00 to 20.00	17.00 to 18.00	18.00	....	.....
No. 1 white pine, per thousand	15 00 to 18.00	....	21.00	.....	.....
No. 1 hemlock, per thousand	15 00 to 18.00	17.00 to 18.00	18.00	12.50	.....
No. 1 yellow pine, per thousand	15 00 to 18.00	16.00 to 18.00	18.00	.....	20.00
LIME					
Common, 200 lb. bbls., per bbl.	3.80	1.75	2.75	2.85	2.50
Finishing, 300 lb. bbls., per bbl.	19.50	.....	.....	3.00	2.50
Hydrated, in paper bags, per ton	.....	20.00	.....	25.00	2.50
LUMBER (Retail Prices per Thousand Delivered)					
Yellow pine, No. 1 boards, 1x6	80.00	95.00	.....	.....	125.00
Yellow pine, B, and better flooring (plain)	130.00	135.00	.....	.....	135.00
Douglas fir, 6x6 to 12x12	80.00	77.00	50 to 60	34.00 to 36.50	.....
Oak, quartered, 1 in., F. A. S.	325.00	370.00	500.00	.....	.....
Oak, plain, 1 in., F. A. S.	225.00	260.00	320.00	.....	200.70
Oak flooring, ¹³⁄₁₆ quartered, white	220.00	370.00	470.00	.....	.....
Maple, 1 in., F. A. S.	180.00	185.00	270.00	.....	.....
Maple flooring, ¹³⁄₁₆ clear	175.00	370.00	225.00	.....	.....
Mahogany, 1 in., F. A. S.	....	225.00	500.00	.....	.....
Spruce, 10 in.	85.00	80 to 140	104.00	.....	.....
Cypress, 1 in., F. A. S.	150.00	150.00	.....	.....	.....
METAL LATH					
Under 100 sq. yd., per sq. yd.	0.40	.35	.....	0.42	0.42

DEPENDABILITY

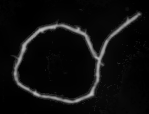
ATLAS-WHITE
is the ideal cement for making mortar to be used in Pointing, Setting and Backing. Its non-staining quality is one of the reasons why Atlas-White is found so often — On the Job.

THE ATLAS PORTLAND CEMENT COMPANY

New York Boston Philadelphia Birmingham
Chicago Dayton Minneapolis Des Moines St. Louis

Upon request we will promptly send to architects **one or all of** *three books:* ***"Color Tones in Stucco,"*** *"Non-Staining* **Mortar for Pointing,** *Setting and Backing,"* ***"Cast Stone."***

ATLAS WHITE

Late Quotations in Building Material Markets—*Continued*

	New York	Chicago	San Francisco	Seattle	Birmingham
PIPE					
Cast iron:					
6 in. and heavier	$67.30	$72.80	.....	92.50	$65.00 to 66.00
4 in.	73.30	75.80	.....	.....	68.00 to 69.00
3 in.	.....	82.80	.....	.....	.....
(And $2 additional for Class A and gas pipe)					
(Discounts to jobbers for carload lots on the Pittsburgh basing card; freight rates from Pittsburgh to New York, and also from Pittsburgh to Chicago, in carloads, per 100 lbs., are 27c. An additional 5 per cent discount is allowed to large jobbing interests over those listed below.)					
	F.O.B. Pittsburgh Butt Weld	F.O.B. Chicago			
Wrought:					
Steel:					
Black, ⅛ to 3 in.	47 to 54 %	38 to 45.1%	.....	34 to 41	.....
Galv., ⅛ to 3 in.	20½ to 41½%	10.1 to 30.1%	.....	31½ to 28	.....
Iron:					
Black, ⅛ to 1½ in.	34½%	11.9 to 22.6%	.....	16½ to 21½	.....
Galv., ⅛ to 1½ in.	+25 to 18½%	+39.9 to 4.6%	.....	3½	.....
	Lap Weld				
Steel:					
Black, 2½ to 6 in.	50 %	41.1%	.....	.....	.....
Galv., 2½ to 6 in.	37½%	27.1%	.....	.....	.....
Iron:					
Black, 2½ to 6 in.	30½%	18 %	.....	.....	.....
Galv., 2½ to 6 in.	17½%	3.6%	.....	.....	.....
PLASTER					
Neat wall cement in 15-cent bags, per ton	23.50	20.00	$18.50 to 20.00	24.50	24.00
Finishing plaster	25.00	20.50	19.50 to 21.00	26.00	24.00
Lath mortar, in cloth bags, per ton	16.50	.....	.....	.....	.....
RADIATION					
Discount from list on standard heights	45%	41 to 42%	.....	41%	44.45%
REINFORCING BARS					
High carbon steel from mill	48.50	.....	47.50	45.00	.....
Medium steel from mill	48.50	.....	55.00	45.00	4.75
ROOFING MATERIAL					
Tarred felt paper:					
No. 1—25 lbs. to 100 sq. ft., per ton	102.00	90.00	.....	120.00	95.00
No. 2—16 lbs. to 100 sq. ft., per ton	81.25	90.00	.....	110.00	95.00
No. 3—12 lbs. to 100 sq. ft., per ton	81.63	90.00	.....	100.00	.....
Rosin sized sheathing, per ton	75.00	.....	.....	110.00	.....
Corrugated roofing, galvanized, 2½ in. corrugation, over flat sheets, per 100 lbs.	0.30	.....	.....	.....	.....
SHINGLES					
Red cedar, 5 to 2, clear, per thousand	15.00	10.00	16.00	6.00	12.00
White cedar, extra star, A star, per thousand	16.00	9.50	17.00	5.75	.....
SLATE ROOFING					
	F.O.B. Cars Quarry Station				
Pennsylvania:					
Best Bangor	$8.00 to $11.00	.....	.....	.....	.....	9.00 to 18.00
No. 1 Bangor Ribbon	8.00 to 9.00	.....	.....	.....	.....	.....
Pen Argyl	7.75 to 8.25	.....	.....	.....	.....	.....
Peach Bottom	10.50 to 12.50	.....	.....	.....	.....	.....
No. 1 Chapman	7.75 to 8.75	.....	.....	.....	.....	.....
Vermont:					
No. 1 Sea Green	5.00 to 8.50	.....	.....	.....	.....	27.00
Unfading Green	6.50 to 13.50	.....	.....	.....	.....	27.00
Red	12.00 to 22.00	.....	.....	.....	.....	30.00
Maine:					
Brownsville, U'f'g Black, No. 1	14.00	.....	.....	.....	.....	.....
Slater's felt, 30 lb. roll	2.00	.....	.....	.....	.....	3.00
Slaters' felt, 40 lb. roll	2.25	.....	.....	.....	.....	3.25
STRUCTURAL STEEL					
Beams and channel, 3 to 15 in., per lb.	3.47	3.47	5.30	4.70 to 5.00	.06 to .0675
Beams and channel, over 15 in., per lb.	3.57	3.57	5.40	.....	.06 to .0685
Angles, 3 to 6 in.	3.47	3.47	.....	4.10	4.70
Zees and tees	3.57	3.47 to 3.52	.....	.....	.....
Steel bars, half extras, from mill	.....	.....	4.90	4.00	.....
STUCCO					
In cloth, per ton (white, mixed)	22.50	20.50	.....	.....	.....
STUCCO BOARD					
Medium weight stucco board, plain, per thousand sq. ft.	65.00	65.00	.....	.....	65.00
Medium weight stucco board, creosoted, per thousand sq. ft.	70.00	70.00	.....	.....	70.00
Heavy weight stucco board, plain, per thousand sq. ft.	75.00	75.00	.....	.....	75.00
Heavy weight stucco board, creosoted, per thousand sq. ft.	80.00	80.00	.....	.....	80.00
Medium weight stucco board, plain, narrow key, per thousand sq. ft.	75.00	75.00	.....	.....	75.00
Medium weight stucco board, narrow key, creosoted, per thousand sq. ft.	70.00	70.00	.....	.....	70.00
Insulating board, heavy felt background, per thousand sq. ft.	70.00	70.00	.....	.....	70.00
SHEATHING BOARD					
Heavy weight, sheathing board, per thousand sq. ft.	70.00	70.00	.....	.....	70.00
Medium weight sheathing board, per thousand sq. ft.	63.00	63.00	.....	.....	63.00
Stucco or plaster board, sheathing board and insulating board are in rolls containing one sheet 25 ft. long and 4 ft. wide (100 sq. ft.).					
WALL BOARD					
Wall board, shipped any length, 4 ft. wide, per thousand	45.00	50.00	.....	60.00	53.00
Packed flat in cars if ordered in less than car lots. Add $5.00 per thousand ft. for crating.